UNDERSTANDING

AI & ROBOTICS

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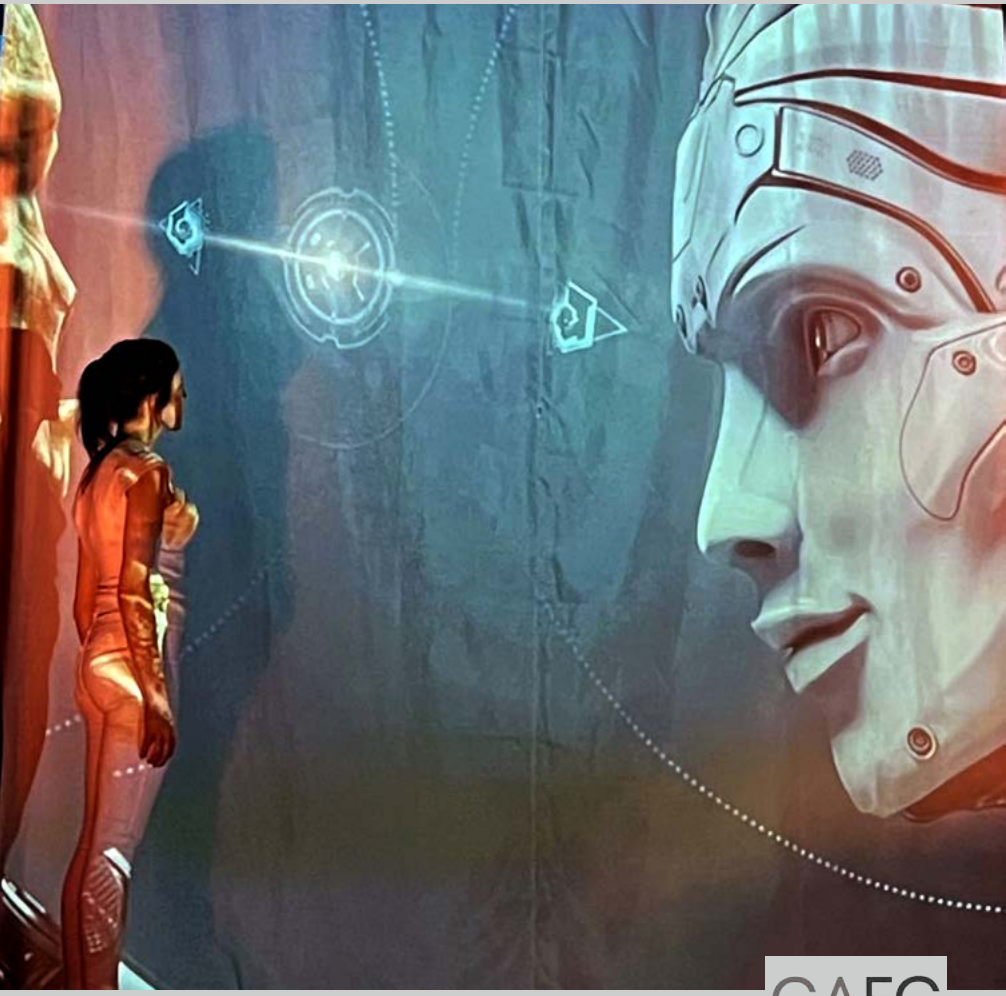

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The manuscript in your hands is based on the proceedings of the 2025 flagship program "Understanding AI and Robotics." The program consisted of eight rounds, each featuring several speakers. Following each round, summary articles were published reflecting the key discussions.

This manuscript (though not a full transcript of the proceedings, which are available upon request) serves as a catalogue of those articles, providing an overview of each of the eight rounds. We therefore apologize for any omissions or possible imperfections in the text.

Foreword

Prof. Anis H. Bajrektarevic,
GAFG's co-founder and ABC

It is my honour to write the foreword to GAFG's first ebook, which I had the privilege to initiate. As our spring 2025 flagship programme, *Understanding AI & Robotics*, demonstrated, its outreach was truly global — multispatial, interdisciplinary, and boundary-crossing. The present ebook in front of you, dear reader, is a natural continuation of that vision: cross-generational, truly transcontinental, and collaborative in its very essence.

That this ebook is a collaborative work of nationals from China, Russia, and the United States, alongside its main editorial lead from Europe, encapsulates both content and symbolism. As such, it sends a bold and much-needed message that goes far beyond the pages that follow. In times when international relations are too often reduced to binary categorisations, when decoupling, confrontation, and fragmentation dominate global discourse, this volume offers instead a meeting ground — a space of sobriety, reason, acceptance, and cooperation.

Equally important is the generational dimension reflected in this work. All principal contributors belong to the emerging

generations of thinkers and practitioners, which gives this ebook a significance that extends beyond its immediate subject matter. While artificial intelligence, robotics, and digital transformation form the thematic core, the deeper concern of this volume is the world as it ought to be: collaborative, inclusive, and conscious of shared responsibility. The challenges of our time cannot be met by technical expertise alone; they require vision, courage, and the ability to think across borders, disciplines, and generations. In this sense, the strong and consistent inclusion of perspectives from the Global South is not an adjunct, but a necessity.

For established decision-makers and institutions, GAFG's interdisciplinary and multispatial orientation offers both confirmation and corrective reflection. For younger generations — across all regions, cultures, and professional trajectories — it offers something equally essential: purpose, orientation, and the conviction that a peaceful, inclusive, and prosperous tomorrow must remain attainable.

This spirit of solidarity is not abstract. It is grounded in lived practice. Through the voluntary commitment of speakers and organisers, broad access to dialogue and learning was made possible, particularly for participants from regions where such opportunities are often limited. In this way, the programme and this ebook came to life without reliance on external financial support, shaped instead by shared values and the belief that access to knowledge should never depend solely on the ability to pay. The organisers and contributors did not merely speak about global understanding and solidarity — they enacted it.

In the longer arc of human organisation, epochs rarely announce themselves with clarity. They unfold first as technological tremors, then as geopolitical rearrangements, and finally as civilisational propositions. The connectivity shift we are witnessing today is precisely such a moment: a quiet yet profound reordering of how individuals, institutions, nation-states, and entire regions relate to one another in an increasingly multi-spatial world. This ebook was conceived not as an academic exercise nor as a technical manual, but as an attempt to illuminate the systemic forces shaping our shared tomorrow. The contributions assembled here are a curated reflection of intense weeks of dialogue, intellectual contestation, and cross-continental encounters.

Our distinguished guests — statesmen, innovators, military strategists, diplomats, artists, and scholars — joined from across the globe, each carrying perspectives shaped by distinct geographies and institutional experiences. They reminded us of a fundamental truth: technology itself is neutral; it is our interpretation, governance, and deployment that determine its consequences. Guided by this understanding, a conscious effort was made to include voices from the Global South and from stakeholders too often absent from global debates, ensuring that discussions shaping the future of humanity are inclusive and representative.

We navigated emerging geographies of the digital age: from AI systems increasingly involved in economic and security decisions, to new corridors of data and energy, to the delicate diplomacy required to preserve sovereignty in a borderless technological ecosystem. We explored the political economy of automation, the cultural filters shaping technological adop-

tion, the legal lacunae exposed by robotics and autonomous systems, and the fragile architectures of digital peace-building. As was aptly noted by one of our opening speakers, technology does not operate in a vacuum, and those who shape its deployment also shape the human experience.

What emerges from these reflections and exchanges is the recognition that the coming decades will not be shaped by technological capacity alone, but by our ability to comprehend, navigate, and responsibly govern its implications. The world ahead will require individuals capable of reading complexity — strategists who understand the interplay between economics, culture, infrastructure, security, and diplomacy as parts of a living system. It will require moral clarity, ethical foresight, and cultural sensitivity, alongside the humility to listen to perspectives that challenge established assumptions.

This ebook is therefore more than a record. It is a testimony to an emerging professional ethos across continents — one committed to ensuring that connectivity remains human-centred, ethically anchored, and globally inclusive. It stands as living proof that dialogue, empathy, and reason can still flourish in an era marked by polarisation and uncertainty. May these pages not only inform, but also orient — serving as an intellectual and moral compass for navigating the turbulent convergence of artificial intelligence, robotics, geopolitics, and human development.

The challenges ahead are considerable, yet so too are the opportunities for those prepared to understand, anticipate, and responsibly guide this evolving form of connectivity of ours. From specialist to strategist, the journey has begun.

Geneva, December 2025

Editorial Note

This volume, Understanding AI & Robotics, is presented as an editorial compendium and proceedings publication emerging from the Certified Connectivity Specialist program on AI & Robotics, convened by the **Global Academy for Future Governance** in collaboration with **SILKROAD 4.0** and a consortium of international partners.

The book documents and curates the intellectual substance of eight weeks of structured, high-level dialogue involving policymakers, senior executives, diplomats, military leaders, technologists, academics, and cultural practitioners from across all global regions. Its purpose is to preserve, contextualize, and make accessible the plurality of perspectives that shaped the program, rather than to advance a single, unified authorial thesis.

Accordingly, this publication is not a classical single-author book nor a technical manual. It is intentionally designed as a curated record of expert interventions, moderated discussions, keynote addresses, and thematic program rounds, reflecting the multidisciplinary, multispatial, and cross-sector nature of the program itself. Individual contributions retain their distinct voices and viewpoints, acknowledging that the

challenges posed by artificial intelligence and robotics cannot be meaningfully reduced to one disciplinary or ideological frame.

Dr. Philipe Reinisch served as Main Editor and Editorial Lead of this volume, acting as the program originator - together with Prof. Anis Bajrektarevic, intellectual convener, and narrative integrator across contributions. His role was to design the overarching structure, frame the thematic coherence of the publication, and curate the contributions in a way that preserves both rigor and diversity of perspective. Editorial responsibilities were shared with the Editor, while substantive content remains the responsibility of the respective contributors.

The intended readership of this volume includes policymakers, institutional leaders, executives, researchers, and practitioners seeking a governance-, systems-, and responsibility-oriented understanding of AI and robotics as societal, geopolitical, economic, and cultural phenomena. The book is best read not as a linear argument, but as a reference and orientation document—one that reflects the state of global, multi-stakeholder discourse at a moment of profound technological and institutional transition.

This editorial approach is deliberate. In an era where technological capability often advances faster than shared understanding, the preservation of informed dialogue, contextual reasoning, and cross-border exchange is itself a substantive contribution.

Prologue
When Machines Meet the World

Kamila Bogdanova
GAFG Multispatial Affairs Senior Officer

Recently I had the privilege to participate in the global online course **"Understanding AI & Robotics."** The experience was both intellectually demanding and deeply energizing, because it did not treat AI as a trend, a buzzword, or a distant technical specialty, but as something already shaping our institutions, economies, and daily lives. I am immensely grateful to be among the co-authors of this e-book, which is rooted in the conversations, reflections, and cross-disciplinary insights that grew out of the program.

From the very first sessions, one message popped up again and again in different forms: artificial intelligence and robotics are not primarily about machines. They are about people, about how we choose to organize our societies, protect what is fragile, and build what is possible. The most meaningful questions discussed were not "How powerful can AI become?" but "What kind of world will we build around it?" and "What principles to insist on when speed and convenience tempt us to compromise?"

AI is often introduced with a kind of theatricality. We hear about "revolutions," "disruption," and the race toward ever more capable models. We are told to admire the speed of progress, or to fear it. The reality is less cinematic and more consequential. AI does not arrive all at once. It steps into our lives through decision systems, sensors, workflows, and interfaces. It enters quietly, through a hospital triage queue, a factory maintenance schedule, an airport arrival sequence, or a fraud-detection engine that decides whether a payment goes through.

And because it arrives quietly, it can reshape society before we have agreed on the rules of the society it is reshaping.

That is why this e-book matters. It does not treat AI and robotics as distant abstractions, nor as a purely technical discipline reserved for engineers. Instead, it approaches the subject the way it appears in real life: as a cross-sector, cross-border phenomenon with ethical, economic, political, cultural, and security dimensions.

The chapters that follow are grounded in global dialogue, voices that do not always share the same assumptions, but share something more valuable: a willingness to compare perspectives without reducing the other side to a caricature.

A book born from a conversation

This publication emerged from a learning environment intentionally designed as a meeting ground, one where different generations, geographies, and professional cultures could think together under conditions that encouraged candor, curiosity, and respectful disagreement. When discussions hap-

pen across continents, with participants from many sectors, the questions change. They become more grounded, and often more honest.

Instead of asking, "What can AI do?" we begin to ask, "What should we allow it to do, and under which conditions?" Instead of "Who will win the AI race?" a more useful question becomes, "How do we prevent the benefits of AI from being captured by a few, while its harms spill onto the many?" And perhaps the most human question of all: "How do we preserve dignity and agency when systems around us grow more automated, faster than our social norms and institutions can adapt?"

These are not theoretical puzzles. They are policy questions, and business ones. They are questions of social cohesion, security, and public trust. In different ways, every chapter in this volume returns to the same insight: governance is not an obstacle to technology. It is the condition for technology to serve society rather than destabilize it.

From fascination to responsibility

It is easy to be fascinated by AI. It is also easy to be overwhelmed. In this book you will encounter both optimism and caution, and you will see why both are necessary.

Optimism is necessary because AI and robotics are already proving their value in areas that matter deeply: earlier detection of disease risk, safer collaboration between humans and machines, more efficient logistics, improved cybersecurity, and better access to services for people who are currently excluded. The promise is real. And for many societies, espe-

cially those that cannot afford long cycles of experimentation or expensive failures, the prospect of doing more with fewer resources is profoundly attractive.

Caution is necessary because AI scales. It scales bias as efficiently as it scales insight. It can amplify misinformation, concentrate power, and tempt institutions to substitute automation for accountability. It can be deployed at a speed that outpaces democratic oversight, legal adaptation, and public understanding. In other words, AI is not only a tool. It is a multiplier of whatever we build into it, our assumptions, our values, our blind spots, and our incentives.

If there is one lesson I carried away from the conversations that shaped this e-book, it is that "human control" is not a slogan. It is a system. It requires transparency, auditability, and the capacity to challenge decisions. It requires education and digital literacy, not only for engineers but for citizens. It requires institutions that can respond to technological change without becoming captive to it. And it requires the courage to admit uncertainty, because in high-impact domains, false certainty is not confidence. It is a hazard.

A perspective shaped by a complicated world

In a time of global tension, technological debates can quickly become political symbols. AI is sometimes treated as yet another arena of confrontation: who leads, who follows, who controls compute, data, and resources. Those dynamics are real. But they do not replace the deeper reality that AI is becoming a shared environment. Code travels. Ideas travel. Risks travel. The health of our information ecosystems, the security of our digital infrastructures, and the resilience of

our critical systems increasingly depend on choices made far beyond any single border.

This is why the ethos behind this e-book—dialogue, cooperation, inclusion—is not naïve. It is strategic. In domains where proliferation is rapid and barriers are low, isolation is a fantasy. The alternative to cooperation is not control; it is fragmentation. And fragmentation increases risk: incompatible standards, uneven safeguards, and a race toward deployment without shared norms. The more fragmented the world becomes, the easier it is for failures, abuses, and miscalculations to spread across borders faster than any institution can respond.

The program that generated this e-book created something rare: a professional space where people with different passports and different assumptions could still speak the same language of responsibility. The chapters that follow do not insist on one ideology. They insist on something more practical: the need for frameworks that keep humans at the center, while allowing societies to innovate in ways that fit their realities.

What the reader should expect

You will not find a single "master theory" of AI governance in these pages. That is deliberate. AI is not one technology. It is a family of technologies embedded in many environments. Governance, therefore, cannot be one-size-fits-all. It must be contextual, tailored to the risks of each sector, sensitive to local conditions, and aware that different societies have different thresholds for surveillance, autonomy, and state-market relationships.

In other words, this is an e-book about AI and robotics, but it is also a guide to thinking in systems.

A small invitation

If you are reading this as a policymaker, you may be searching for actionable insights: what to regulate, what to fund, what to prohibit, what to promote. If you are reading as an executive or practitioner, you may be looking for competitive advantage and risk mitigation. If you are reading as a student or citizen, you may simply be trying to understand what is happening around you.

Wherever you stand, I invite you to read this e-book with two habits.

First, resist extremes. AI is neither salvation nor apocalypse. It is a set of powerful tools that will behave according to the constraints we place on them and the incentives we build around them.

Second, keep asking the implementation question. Not only, "Is this possible?" but: "Under what conditions is this safe, fair, accountable, and worthy of trust?" The future will not be decided by the most impressive demonstration. It will be decided by what survives contact with reality, and by whether societies can scale responsibility as effectively as they scale capability.

In the program that gave birth to these pages, the most memorable moments were not the moments of certainty. They were the moments when experts admitted complexity: when a technologist recognized the limits of a model, when a diplomat recognized the limits of regulation, when an artist re-

minded us that the human spirit is not an output to be optimized, and when participants from different continents asked each other, sincerely, how to build something that serves more than one interest.

That is the spirit of this e-book. It is a record of an encounter: between disciplines, between generations, between institutions, and between the human world and the machines we are creating.

May these pages not only inform you but also steady you. The connectivity shift is already underway, and the most urgent task is not to watch it happen, but to shape it with reason, humility, and a deep respect for the lives that will be lived inside the systems we build.

How to Read This Volume

This volume is not a textbook, nor does it advance a single doctrinal position.

Chapters are designed to be read independently and may reflect intentionally divergent perspectives. The contributions collected here span different institutional, disciplinary, and regional standpoints.

Rather than prescribing conclusions, the volume prioritises reflection, dialogue, and contextual insight. Readers are invited to engage selectively, according to their interests and professional needs.

I
Preface

This volume documents and curates the intellectual contributions emerging from the *Understanding AI & Robotics* program—a certified, non-degree executive course delivered over eight consecutive weeks and designed for mid- to senior-level professionals from diverse institutional and regional backgrounds.

The program was conceived as an interdisciplinary forum in which artificial intelligence and robotics could be examined not only as technological systems, but as forces shaping governance, economic development, cultural interaction, and international cooperation. Rather than privileging a single disciplinary lens, the course deliberately brought together perspectives from technology, policy, economics, security, media, and the social sciences.

Participants and contributors represented a wide range of professional experiences, institutional affiliations, and geographic contexts. This diversity was not incidental; it reflected the program's underlying assumption that the implications of AI and robotics cannot be meaningfully understood without engaging voices from different regions, sectors, and governance traditions.

In addition to plenary sessions, selected discussions were conducted in smaller, closed formats to enable deeper exchange and candid dialogue. The program was further complemented by session reports and reflective articles prepared by participants and published across international media platforms, extending the conversation beyond the classroom while preserving its analytical integrity.

This book does not seek to present a unified doctrine or a definitive position on AI and robotics. Instead, it serves as an **editorial record of a multi-stakeholder dialogue**, capturing how senior practitioners, policymakers, and scholars articulated challenges, tensions, and opportunities at a particular moment of technological and geopolitical transition.

Readers are encouraged to approach this volume not as a linear argument, but as a collection of contextual perspectives and informed interventions. Its value lies in the plurality of viewpoints it preserves and in the connective insights that emerge at the intersections of disciplines, regions, and institutional roles.

II
Opening Addresses and Key Interventions

2. 1 Openings from Ambassador Isiaka Abdulqadir Imam

Distinguished participants, esteemed speakers, colleagues,

I am honored to address this global multidisciplinary course on Understanding Artificial Intelligence, Robotics and its Multidimensional and Multispatial Application in Public and Private Sector, organized by the International Institute for Middle East and Balkan Studies (IFIMES) in collaboration with the SILKROAD 4.0connectivity framework.

On behalf of the Developing Eight Organization for Economic Cooperation (D-8), I would like to express my deep appreciation to IFIMES, particularly to Professor Anis Bajrektarevic, for their continuous collaboration with our organization. We are indeed grateful for the free virtual seats allocated to the D-8 member states to participate in this very important course. Your generosity reinforces our shared commitment to inclusive technological advancement.

Artificial Intelligence—otherwise known as AI—is no longer a futuristic concept; it is a transformative force in our way of life. The theme of this course is highly timely and is aligned

with the D-8 strategic vision for the future, with the understanding that AI, the Internet of Things, and Digitalization will shape the way the D-8 conducts its business.

The linkage between AI, IoT, and Digitalization represents the building blocks of what we refer to as a **Neo-Global Operating System**—a system where data, algorithms, and connectivity shape economies, societies, and governments.

For us at the D-8, the use of technology and AI is essential, considering that our member states are spread across Africa, Europe, and Asia. Ensuring adequate connectivity will therefore rely strongly on unlocking AI's vast potential to serve as a force multiplier in all spheres of life.

As AI and connectivity become central to global power dynamics, developing countries must have a seat at the table—not just as observers, but as active contributors and co-creators of digital norms, standards, and ethical frameworks. The Global South must continue to voice its views within the global arena, particularly regarding the establishment of digital norms and standards. In this regard, the D-8 is prepared to work together to ensure that the digital future reflects the values, needs, and aspirations of our diverse member states.

Allow me to briefly highlight a few initiatives of D-8:

The D-8 Network for Diplomatic Institutes (D-8 NDI) was established this year to promote collaboration among our diplomatic academies through capacity building, AI, economic diplomacy, food security, energy, trade, and climate action.

The D-8 Technology Transfer and Exchange Network (D-8 D10) has proposed the initiative titled ALL AIDI, in cooper-

ation with the D-8 Framework, aiming to enhance trade efficiency and foster technological collaboration among member states.

The D-8 E-Government Network was established to share experiences and strategies in implementing e-government initiatives and digital transformation. Later this year, this network will convene its first virtual coordination meeting in collaboration with the Digital Transformation Office of the Republic of Torkia.

To conclude, distinguished participants, ladies and gentlemen, let me once again thank the organizers for inviting me. I had the honor of serving as the Chairperson for the Austrian Stanley Station Agency Internet of Things for approximately five years, and I heard several points today that suggest promising opportunities for joint projects.

My sincere congratulations for this partnership—very interesting.

Thank you so much for bringing this together here.

Ambassador Isiaka Abdulqadir Imam. The fifth Secretary-General of the D-8 Organization for Economic Cooperation since 2022, has a professional background that includes roles as a banker and a diplomat. He served in Nigeria, Brazil, Saudi Arabia, South Africa, and Japan.

2. 2 Intervention with Charles Oppenheimer
At the Crossroads of Power and Peril

The following exchange reflects a moderated discussion on historical analogies between nuclear technology and artificial intelligence, focusing on governance, secrecy, and existential risk.

Dr. Philipe Reinisch (Moderator):

I am excited to hear from our next speaker, Charles Oppenheimer. For anyone unfamiliar with your grandfather's legacy, he played a pivotal role in the development of nuclear technology and later became a powerful voice for its safe use and proliferation. To begin, could you talk about how you see his legacy? The connections to the past and the post-World War II story are important lessons for us all.

Charles Oppenheimer:

Those connections are not often emphasized enough. The technology became so powerful that warfare was fundamentally transformed. Winning a battle was no longer the point; my grandfather and others foresaw with amazing prescience the entire trajectory of the arms race. They understood that a

direct conflict could no longer be won—it would destroy the world.

He helped establish a policy framework for dealing with existential threats after World War II. This represented a new idea: when you possess something as dangerous as fission energy, no single group can effectively control all the science and use it to defeat the other side.

The modern corollary is the connection between nuclear energy and AI. Are we now at a moment where we are ushering another powerful technology into the world, one that could either help us or destroy the Earth? That is the big question.

However, we lack the same scientific clarity about artificial intelligence that we had with fission. When fission emerged, a small group of scientists, including my grandfather and Niels Bohr, understood precisely what would happen. They knew the amount of energy that would be released, the potential for bombs, and that a devastating arms race would follow. That clarity came from underlying scientific principles.

AI is not of that nature. First, it lacks a foundational theory that we fully understand—we don't even agree on what it means to have reached a certain "level" of intelligence. Second, it is proven through experimentation, manifesting through large-scale trials where the potential dangers are not clearly defined. Finally, the concept of recursive self-improvement, where AI enhances itself and threatens everyone, is something that AI scientists aren't even sure will happen.

The historical lesson is that it is natural for a country to want to monopolize a powerful secret technology. That thinking

caused the Cold War. But a wiser perspective, understood even then, is that you cannot prevent the other side from understanding fundamental science. With fission, the idea that you could maintain secrecy and own the technology simply does not work.

So, how close is AI to that? It is similar in many ways but is infinitely more proliferative and moves much faster. With fission, you can control the fissile material—a process that is energy-intensive and visible to all.

Prof. Anis Bajrektarevic:

Exactly. Everyone can see you creating that dangerous material, making prevention possible. But with AI, which is software and code, keeping it secret is not a realistic option. If it can be made, it will spread. Therefore, we have to work together on it. Essentially, through open sourcing or open science, we have a better chance of achieving safety than by trying to hide it, because that ultimately doesn't work.

Having someone like me on stage giving you the definitive answer is not the solution; it must be an ongoing discussion. A promising sign is that among the countries with the hardest relations—China, the U.S., and Russia—there is more appetite to discuss the potential and threats of AI than even more established, difficult topics like nuclear weapons. There is a clear willingness to try to find a common framework.

This brings us back to the existential risk policy formed after WWII. When you possess a dangerous technology like fission, can you build an advantage by keeping it secret? The central

question—whether we will get along with our enemies or try to destroy them with science—is directly relevant to AI today.

You cannot simply dismiss the notion that we can find common ground with our worst enemies. There is room for commonality, even regarding the worst threats. We spend time discussing these impossible topics, and then we must ask ourselves tactically: can we do things that bring hope in a reasonable time frame?

My focus has been on the positive side of nuclear energy. Can it be a bridge to eliminating our weapons through increased dialogue? Reconciliation is difficult on an institutional level, but I know what works on a human level: sitting down and talking to people. It's not science; it's something more profound. Creating a human connection makes me hopeful and optimistic.

For example, using the same science that created the bomb, could we achieve a level of energy abundance beyond anything we thought possible? That is a very hopeful prospect. It is a much better place to start a conversation about a difficult technology than by saying, "We're all going to die." Starting with only threats and no hope leaves no room for dialogue.

The long-term trend in society is the exponential improvement of technology, and this version of algorithmic progress is a prime example. This will not stop. And it brings immense hope: abundant energy, abundant intelligence. There are so many things we cannot do well today—from fixing houses and cars to revolutionizing healthcare—where this technology offers unbelievable levels of improvement.

It is just as appropriate to look at the hopeful side. The hardest problems in the world can be addressed. We must not turn away from them.

Charles Oppenheimer. Grandson of J. Robert Oppenheimer, is the founder of the Oppenheimer Project. He applies his Silicon Valley experience to lead Oppenheimer Energy Ventures in tackling nuclear risks and climate change through fission technology. A sought-after voice, he frequently speaks at global forums and contributes to major media on these critical issues.

2.3 Integral text of the article/contribution of Hon Geoffrey Hoon

Speech from Rt Hon Geoffrey Hoon , former UK Secretary of State for Defence - The Understanding of AI as a Societal Project

Ladies and gentlemen, colleagues, distinguished guests,

It's a privilege to be here with defense professionals, technologists, scholars, and strategic thinkers—each committed to shaping a secure and resilient global future. I extend my sincere thanks to Professor Anis, to IFIMES, and to the Global Academy for Future Governance for organizing this vital series of discussion on artificial intelligence and robotics—topics that increasingly define the trajectory of our global civilisation: the understanding—and the implications—of Artificial Intelligence.

Having spent the better part of my career immersed in questions of national defence, strategy, and governance, I have often been confronted with new technologies that force us to recalibrate both our expectations and our responsibilities. From the Cold War's nuclear stand-off to today's digital battlefield,

each generation faces its own version of transformative risk. In our time, that risk—and that promise—carries a name: Artificial Intelligence.

The Strategic Importance of Understanding AI

When I first entered public service, technology was already beginning to reshape military doctrine. Precision weaponry, network-centric warfare, unmanned systems—these were harbingers of a revolution in defence affairs. But Artificial Intelligence is different. It is not merely another instrument in our arsenal; it is a force multiplier, a decision-maker, and potentially, a policy-shaper in its own right.

AI systems can now interpret satellite images with greater accuracy than human analysts. They can autonomously monitor cyber threats, control drone swarms, and conduct real-time logistics coordination with minimal human oversight. In the future, they may be entrusted with decisions that bear lethal consequences. The strategic implications are profound, and they extend well beyond the battlefield.

But AI is not limited to defence. It is woven into our healthcare systems, financial institutions, transport networks, and increasingly, our democratic processes. In short, the domain of AI is the domain of governance itself.

During my time in the UK Parliament, particularly as Secretary of State for Defence from 1999 to 2005, I had the responsibility of overseeing some of the nation's most significant investments in military research and emerging technologies. I worked closely with our scientific communities, defence contractors, and NATO partners to integrate innovation into

national security policy. Even then, we saw the early seeds of what AI could become—tools that could enhance decision-making, protect lives, and redefine modern warfare. Today, that frontier has expanded dramatically, making it even more vital that we understand the forces now shaping our world.

The Necessity of Ethical and Democratic Oversight

Let me be blunt: technology does not arrive with a built-in moral compass. AI is created by people—trained on data often riddled with bias, shaped by the commercial priorities of powerful companies, and deployed in contexts where transparency is elusive. This demands rigorous ethical scrutiny. What are the principles that should guide the development and deployment of AI? Who decides when an AI system is sufficiently trustworthy to make decisions about a person's freedom, livelihood, or security? These are not questions for engineers alone. They require the active engagement of policymakers, ethicists, civil society, and above all—citizens.

As a former Defence Secretary, I know that in moments of crisis, decisions are made at pace. But speed must never come at the expense of accountability. Any military or governmental use of AI must be embedded in clear lines of democratic control, oversight, and public legitimacy.

The Geopolitical Landscape

We must also view AI through the lens of geopolitics. The global race to develop and dominate AI is often framed as a contest between great powers. The United States and China are investing vast sums into AI research, with Europe seek-

ing to carve out a third way—one rooted in human rights, privacy, and regulatory rigor. This is not just a technological competition; it is a clash of values. If we believe in democracy, in individual liberty, and in the rule of law, we must build AI systems that reflect and reinforce those values. That means resisting the temptation to adopt opaque surveillance models in the name of efficiency or control.

It also means forging international agreements to prevent the weaponisation of AI in ways that could destabilise global security. Just as we established treaties around nuclear arms, we must now consider similar frameworks for autonomous weapons, algorithmic warfare, and the misuse of AI in hybrid or information conflicts.

AI and the Future of Work

Of course, the AI revolution will not remain confined to governments or tech giants. It is already changing the way ordinary people live and work. Some fear that AI will replace jobs wholesale—drivers, accountants, even journalists. And there is truth in that concern. But we should not be paralysed by fear. Instead, we must invest in education and retraining, so that the workforce of the future is equipped to work alongside AI—not be displaced by it. If AI can automate tedious tasks, then human beings can focus on what we do best: creative thinking, empathy, leadership, and moral judgment.

But this transition must be managed. Governments have a duty to anticipate the social impact of AI and to cushion the blow for those who may be left behind. A just transition, not an abrupt upheaval, is the imperative of our time.

A Call to Informed Citizenship

Ultimately, the "Understanding of AI" must be a societal project. It is not enough for a handful of experts or regulators to understand these systems. Every citizen deserves to know how decisions that affect them are being made. Every student should learn not just how to use AI, but how it works—and why that matters. This is why this programme is so important. By fostering public literacy in AI, we strengthen the democratic foundations of our society. We make ourselves more resilient to manipulation, to inequality, to authoritarian misuse.

In the years ahead, we will need more than innovation. We will need wisdom—collective wisdom. We will need leadership that understands that the choices we make now will echo for generations. And we will need vigilance. Because the stakes are high.

Conclusion

Let me close with a reflection. When I served in government, we faced threats that were visible, tangible, and in some cases, predictable. AI is different. It is diffuse, embedded in code, and often acts invisibly. But its effects will be anything but hidden. As I explore in more detail in my recent book, See How They Run, leadership today demands both foresight and humility. We have a choice. We can treat AI as an opaque force that simply happens to us. Or we can understand it, shape it, and guide it in accordance with our deepest values.

Let this be the moment we choose understanding over ignorance, governance over chaos, and humanity over hubris.

Thank you.

The Rt Hon Geoffrey Hoon served as the UK's Secretary of State for Defence from 1999 to 2005. In this role, he was responsible for overseeing the UK's armed forces and guiding significant military technological modernization. He also held the positions of Secretary of State for Transport and Government Chief Whip. Prior to his ministerial career, he served as a Member of the European Parliament and later as a Member of the UK Parliament.

III
8 Program Rounds

3.1 The 1st Session
Equity, Ethics and Cooperation in the age of AI
Rapporteur: Jenna Ellis

The AI Program not only included many of the great minds in the AI development space today but also contributed a key role to the global understanding of AI from the Global North and the Global South.

On May 22, the *Understanding AI & Robotics* training program kick-off participants engaged in a dynamic session that exemplified the program's multidisciplinary, multi-spatial, and true global approach. This program, offered in collaboration between **IFIMES** (International Institute for Middle Eastern and Balkan Studies), **SILKROAD 4.0**, **Scientific Magazine European Perspectives**, and a consortium of their international partners (such as the **D-8**, **THC**, **ICCD**, **LLA**, **Modern Diplomacy**, **C4P**, and many more) through the Global Academy for Geotech Futures, bridged public–private implementation and was tailored for policymakers, executives, practitioners, researchers, and postgraduates.

The AI Program not only brought together many of the leading minds in AI but also played a key role in advancing global understanding of AI across the Global North and Global South. Demonstrating a commitment to accessibility, the program's directors invested in equity by providing free seats for participants from least-developed and developing countries in the Global South, including participants from the American, African, and Asian continents.

The thorough discussions reflected the program's overarching objective: to equip policymakers and top executives with a comprehensive (multi-spatial and multidimensional) understanding of AI and robotics from technological, ethical, economic, sociopolitical, security, and cultural perspectives.

The content-intensive 2.5-hour session combined keynote presentations, expert-led lectures, and interactive discussions. Guest speakers included leading figures from the public and private sectors, research, and academia, who offered real-world insights into current trends and dilemmas in AI governance. The participants had the privilege of hearing from great leaders and thinkers such as the Development 8 (D8) Secretary General, **Isiaka A. Imam**; Organization of Petroleum Exporting Countries (OPEC) Secretary General, **Adnan Shihab-Eldin**; and CEO of the Oppenheimer Project and family trust **Charles Oppenheimer**, grandson of the late Robert Oppenheimer, father of the atomic bomb.

Their presentations highlighted the dual-use nature of AI—how these technologies can drive tremendous social benefit while simultaneously posing risks around surveillance, bias, and inequality. Participants examined these tensions through

a global lens, exploring how different regions are experiencing and responding to AI's impacts.

Human-centric and ethical dimensions of AI

A central focus of the session was on human-centric, developmental, and ethical (multi-spatial) design. Discussions emphasized the need for fairness, transparency, and accountability in the development of AI systems. Speakers and participants alike inquired and demonstrated how ethical considerations are being integrated—or neglected—in the deployment of intelligent technologies across various sectors. They also reflected on frameworks that promote responsible innovation, particularly in areas involving sensitive data and critical infrastructure, especially for the Global South.

Secretary General **Isiaka Imam** shared his experience working with **D8**, an organization that represents 1.2 billion people in some of the most vibrant demographics and economies of the world, and the importance of AI cooperation for economic development and stability in developing nations.

Secretary General Imam opened his session with a statement acknowledging the reality of our digital world:

"AI is no longer a futuristic concept. It is a way of life, and we must work to harness it responsibly and strategically," and acknowledged that this can only be done through collaboration between both the international public and private sectors."

He shared the main objectives of the organization: focusing on AI peace-building instead of investment in AI-supported conflict, supporting continued communication instead of

confrontation, increasing cooperation instead of exploitation, and promoting justice instead of double standards in international policy, specifically regarding the global south, ensuring equality instead of discrimination, and using AI to promote democracy instead of oppression.

Cooperation over competition: voices from diplomacy and industry

Following the first speaker, former Secretary-General of OPEC, **Dr. Adnan Shihab-Eldin**, acknowledged that both AI development and the robotic revolution are **"quantum steps"** for human civilization. He echoed sentiments shared by the previous speaker that with great power comes great responsibility to use these powers for the betterment of humanity. While AI development can seem inaccessible to many, Secretary General Shihab-Eldin stressed the role that AI can play in combating global issues today and supporting development such as the climate crisis, global hunger, and generational poverty within certain regions of the world, specifically the Global South.

Now that technology is more available and versatile than ever, his sentiments and thoughts on the need for collaborative development, but also indigenous digital emancipation of the Global South, to ensure access is promoted globally, resonated with the previous speaker: *"Technology is now more accessible than ever, and we must work to domesticate it for the greater good."*

The third keynote speaker, **Charles Oppenheimer** of the Oppenheimer Institute, added his insight on this topic, circling

back to work his late grandfather had done to promote global peace, regardless of the creation of weapons of mass destruction. He illustrated examples from the past and present that non-proliferation measures can only be implemented if there is a global consensus on working together as nations with opposing viewpoints. Using historical context to frame the modern day, he referenced his grandfather's work to develop nuclear warfare for military purposes during World War Two, and despite large efforts to enforce secrecy surrounding these projects, this mentality and framework only contributed to the large-scale division that was seen during the Cold War and even continues today in 2025.

While states may be inclined to keep technological advancements localized within their domestic sector, both public and private, Oppenheimer contends why that would not be the best option to ensure a more secure digital future.

"AI today is what nuclear physics was in the 1940s. Keeping it (AI development) a secret is not an option; we have to work together on it through open-sourcing science. By doing so, you have a better chance and likelihood of safety."

From principles to practice

The session concluded with a presentation facilitated by the Austrian Ambassador to Vietnam, **Philipp Agathonos**. As a subject matter expert, Excellency Ambassador provided an insightful perspective on the practical applications of AI. He emphasized that AI is not an all-powerful, intelligent being but rather a trained machine that can assist with specific tasks. Agathonos highlighted several real-world examples

from Austria, such as the **"Fake Shop Detector"** that uses AI to predict the likelihood of an online shop delivering the purchased product.

Another application Agathonos discussed was using AI for cybersecurity, where it can detect anomalies in system behaviour and alert human experts to investigate further. He also mentioned text analysis tools that can create "information nutrition labels" to quickly assess the content and potential biases in online articles and documents. Agathonos noted that these tools were developed by **DI Helmut Leopold, PhD**, and the team at the Austrian Institute of Technology (AIT).

Agathonos stressed the importance of maintaining human control over AI systems, noting the risks of data manipulation, censorship, and the potential for misuse. He advocated for the development of AI that is transparent, ethical, and serves to empower and benefit people rather than replace or threaten them. Overall, Agathonos provided a balanced and pragmatic view on the current state and future potential of AI technology, drawing on the expertise of Helmut Leopold, developed under the AIT, and prepared for this occasion.

Cooperation is not optional

The session and all its speakers explored the growing need for global cooperation and inclusive governance, digital rights, and obligations, too. One of the highlights was a discussion between participants and speakers on how to continue incorporating digital literacy into a rapidly developing digital world and understanding when to depend on AI over human interaction and experience. This led to deeper conversations about how international alliances, including partnerships be-

tween the OECD world and the Global South, are essential for building equitable and secure digital ecosystems. The importance of engaging underrepresented regions in AI development was a recurring theme, reinforcing the AI Program's commitment to democratizing AI and ensuring global participation in setting ethical standards and shaping future technologies.

By the end of the session, participants left with a stronger grasp of how AI technologies and robotics are both shaping and shaped by complex social dynamics. They gained insight into the ethical and geopolitical dimensions of emerging technologies and deepened their understanding of the responsibilities involved in developing, deploying, and governing intelligent systems. The first session not only advanced the participants' technical and conceptual knowledge but also reinforced the AI Program's mission: to foster informed, critical, and inclusive dialogue around one of the most defining challenges—and opportunities—of our time.

Jenna Ellis of St. Mary's University in (Twickenham) UK. She was previously working with survivors of crime in the United States. Since spring 2025 Ms. Ellis has been the London-based IFIMES Information Officer.

3.2 The 2nd Session

Global Dialogue on Bridging Humans and Robots
Rapporteur: Inna Turchenko

The second session of the global course explored **Digital Communities and Peace Technology**, highlighting how technology can serve as a tool for conflict resolution, international cooperation, and civic engagement—especially in complex or divided environments. Discussions addressed digital trust-building across borders, cross-border communities, and technology-driven peace initiatives.

Featured keynote speakers included **Olga Algayerova**, a Slovak diplomat and former Executive Secretary of the United Nations Economic Commission for Europe (UNECE), who shared insights on how multilateral diplomacy could build inclusive AI-governance frameworks. **Ilham Akbar Habibie**, Chairman of Indonesia's National ICT Council, Chair of the Agency for Research and Technology at the Indonesian Chamber of Commerce and Industry, and Chairman of Regio Aviasi Industri, presented Indonesia's strategic vision for AI development, emphasizing equitable access and transparency in algorithmic design. Together, their contributions underscored the urgent need to align technological progress with human values, societal resilience, and coherent global policy mechanisms.

Global Perspectives on AI Governance and Equity

In a recent conversation with a top diplomat, **Olga Algayerova,** participants examined the wide-reaching impact of AI and robotics on governance systems worldwide. The central question was clear: how could institutions build a deep, holistic understanding of the multidimensional and multispatial implications of AI for both the public and private sectors?

AI and robotics already affected every domain—economic, legal, social, and cultural—and held transformative potential to help bridge inequalities between the **Global North** and **Global South**. As H.E. Algayerova emphasized, the need for global AI governance grew more urgent by the day: "*We must ensure AI development aligns with human values and that we proactively mitigate threats before they evolve into systemic risks,*" she said.

She warned that, without appropriate governance, societies would face a cascade of challenges, including risks to safety and individual well-being, inequity and unfair outcomes, erosion of global standards and interoperability, geopolitical instability, ethical lapses in development, and persistent gaps in collaboration, scientific progress, and capacity-building. Her exchange with participants was practical and forward-looking. She challenged the group to imagine a world filled with autonomous systems—exciting and futuristic, yes—but asked what would happen when such systems malfunctioned or were misused, especially given that regulation lagged behind manufacturing. The path forward, she argued, lay in advancing smart regulation, establishing clear ethical standards, and fostering responsible innovation—ensuring a durable balance between human agency and machine autonomy.

Voices from Asia: Innovation and Transformation in Indonesia

To bring a perspective from another continent, the program welcomed **Dr. Ilham Akbar Habibie**, a leading figure in Indonesia's aerospace and innovation sectors. Dr. Habibie presented **Vision 2045**, built around four strategic pillars: human development and mastery of science and technology, sustainable economic growth, equitable national development, and the strengthening of governance and institutions. He outlined an innovative pathway for integrating AI and robotics into national development. Indonesia, with its young and digitally fluent population, seized this opportunity—two-thirds of Millennials and Gen Z believed AI could improve their work–life balance—and the country invested in high-quality digital infrastructure that emphasized efficiency, accessibility, and affordability.

He also flagged key challenges and strategic priorities, including ensuring that AI algorithms were understandable and accountable, and making expert access and system transparency more robust and inclusive. Participants left with a question worthy of continued reflection: as machine-learning systems increasingly learn not only from humans but also from one another, how might this accelerate innovation and real-time problem-solving—and what safeguards should accompany that transformation?

Europe's Path to Sustainable AI in Agriculture

Dr. Franz Fischler—former European Commissioner for Agriculture, Rural Development, and Fisheries, and former

President of the European Forum Alpbach—had been slated to deliver a keynote for this session. Although he could not attend, the organizers shared his earlier topical work, which framed a discussion of sustainable intensification—increasing agricultural productivity while minimizing environmental harm and conserving natural resources. Drawing on these contributions, he emphasized three priorities: investing in research and development of eco-friendly technologies (including AI-powered precision agriculture and biological pest control), adopting agile governance models that reduce bureaucratic obstacles, and expanding EU-level funding for research, innovation, and sustainability. His message was unequivocal: policy innovation had to advance hand in hand with technological innovation to build resilient, sustainable agro-ecosystems.

The Road Ahead: Shared Responsibility

After the keynote addresses, the session featured dynamic, interdisciplinary discussions that spanned the technical, social, and creative dimensions of AI. Participants engaged in a substantive dialogue with **Dr. Josef Baker-Brunnbauer**, author of *Trustworthy Artificial Intelligence Implementation*, on AI ethics, environmental impacts, human-rights implications, principal risks, and policymaking. The exchange also highlighted a notable correlation between a country's happiness index and its level of AI development—linking technological progress to human well-being.

Across these dialogues, a consistent message emerged: AI and robotics were no longer abstract concepts; they had become embedded in nearly every domain of human activity.

Practical and strategic questions remained for the remainder of the course: how to ensure inclusive access to AI education and capacity-building worldwide; which mechanisms could prevent the monopolization of key AI technologies; how to balance human burnout with AI-enabled efficiency; and how to account for environmental consequences such as energy use, e-waste, and carbon footprints.

Inna Turchenko, the 'Executive Master in International Relations and Global Politics' graduate. She is specialized in risk-management, compliance and transformation of processes in Governmental authorities, European commercial banks and the National Bank of Ukraine.

3.3 The 3rd Session

Artificial Intelligence and Defensive Modernisation
Rapporteur: Jesinta Adams

The third session of the Understanding AI programme turned its focus to how artificial intelligence is reshaping global security, defence strategy, and geopolitics. Under the theme **"Defensive Modernisation as the Technology Driver,"** discussions bridged military innovation with ethical, legal, and governance questions.

The first keynote guest, **Ambassador Ali Goutali**, of the Jeddah-based Organization of Islamic Cooperation (OIC), brought a diplomatic and scholarly lens to the conversation. With over two decades of ambassadorial service and a strong academic background, Ambassador Goutali reminded us of the dual nature of AI. He described AI as a force of promise — for knowledge-sharing among nations, early warning systems for pandemics, and enhanced surveillance — but also one of equal risk. Ambassador warned that AI, if unchecked, could dismantle governments and destabilise wisdom-based governance.

This top MENA diplomat from Tunisia called for the establishment of global conventions on AI use, similar to the Geneva Conventions, to protect humanity and maintain ethical

boundaries. His conclusion was clear: more member states must actively engage in AI protocols to prevent future misuse.

Multi-spatial and multidimensional nature of future wars

In the second keynote, former Chief of Staff of the Armed Forces of Croatia **Admiral Davor Domazet-Lošo** shared his insights on evolving military doctrines. A former combat commander, and later prolific author on military strategy, Admiral Domazet-Lošo explored the rise of information warfare. He warned that such warfare blocks a person's ability to think independently — an effect that can be seen even among world leaders. He cited China's AI capabilities as being significantly ahead of the United States and spoke of China's "deep seek" AI system, which, in his words, embodies the true potential of artificial intelligence. He emphasised that AI-driven military strategy is now operating in hyper-real time, reducing detection and response time from one hour to mere seconds (doctrines of real time shifting to the network doctrines of hyper-real time). The goal for all militaries, he suggested, is to discover, decide, and destroy — faster than ever before.

Hyper-real time warfare naturally blurs the boundary between perception and action, where information dominance and computational speed become as critical as kinetic force. This doctrine will surely raise significant ethical, legal, and strategic challenges, including concerns over human oversight, escalatory dynamics and de-escalatory potentials, false data entries and accuracy and speed of mistake detection and correction – hence an entire reliability of real-time data streams.

Based on his previous exchanges (on the trajectory of Asian security) with the 'Understanding AI' program originator,

prof. Anis H. Bajrektarevic, Admiral Lošo singled out the military theatre more neuralgic than the current ones in Eastern Europe and in the Middle East: *"The hyper real-time potential of combat in Indo-Pacific, so packed with mega-demographies and mega-economies, hence projection drives is possible yet still avoidable. It would be a sobering study in technological velocity and strategic ambiguity to analyse every perspective thoroughly. Unlike the Adriatic or even Mediterranean, where engagements are relatively constrained by geography and proximities of all sorts, the Indo-Pacific – especially Malacca Straits and South China Sea – is a volatile mesh of overlapping claims, promising yet imperfect unmanned systems, (inadequately tested) hypersonic threats, and AI-driven targeting loops. In such an environment – including the inner seas of archipelagic states of Indonesia and the Philippines, but also Malaysia and Vietnam, decision cycles will be compressed to seconds, not hours, with autonomous swarms and satellite-linked ISR platforms dictating the tempo. As a former Chief-of Staff, admiral and combat army officer of a historic naval country (right between Ancient Greece and Roman Empire, Phoenicians and Venetians), I would note with high concern how conventional naval doctrine falters when even milliseconds of latency could determine the survivability of a ship—raising critical questions about control, accountability, and escalation in a digitally saturated battlespace where the line between provocation and war is algorithmically blurred."*

Takeaways from Singapore

The main speaker for the session was **Lily Ong**, a geopolitical and cybersecurity analyst from Singapore. A former Track I and Track II diplomat in the United States, Ong took a brief departure from her attendance at the Global Digital Forum to

deliver a compelling presentation on how AI is transforming global power dynamics. She walked us through AI's military applications — from automated defence systems and predictive analytics to offensive cyber operations and information warfare. Ong emphasised that AI is not only changing how wars are fought but also how power is projected and negotiated. Her talk also explored the ethical and legal questions surrounding AI-enabled warfare, and she challenged us to think about the shifting nature of trust, sovereignty, and responsibility in a hyper-connected world.

One of the most striking moments in her presentation was her response to a participant who asked why countries would pursue such advanced AI capabilities if they introduce greater instability. Her answer was sobering: "*The genie is already out of the bag – there's no putting it back.*" Instead, countries — especially those in the Global South — must focus on keeping up, not only to stay relevant but to protect themselves. She stressed that education is key to this transformation and urged the Global South to come to the AI table so that they could contribute to capacity building through education, innovation, and shared expertise.

Ong concluded by accentuating that the new arms race formulated upon technological sovereignty would enable more actors – including smaller states and non-state actors – to shoot above their calibre, introducing a layer of complexity to the AI-enabled warfare environment.

The session closed with a unifying message from all speakers: the urgency for better global protocols, more inclusive international participation, and a deeper emphasis on education. The generational gap was also addressed, with a call

for both the tech-fluent younger generation and the cautious older generation to learn about AI risks and opportunities — together. It is no longer an option to retreat – adaptation is imperative.

The third session of the extraordinary program, unparalleled by anyone in the world, provided not only deep strategic insights but also a human-centred reflection on the challenges we face as AI advances at breakneck speed. From military use to global governance, the message was consistent: AI is here, and it demands collective oversight and responsibility.

Jesinta Adams serves as the GAFG Assistant Director-General for Africa.

3.4 The 4th Session

From Algorithms to Influence: Navigating the Strategic Layers of AI
Rapporteur: Samir Mujkovic

On June 12, the Understanding AI & Robotics training program reached its fourth session in an ambitious eight-week journey across the geopolitical, technological, and ethical frontiers of AI and robotics.

The 4th session began with discussions about technical challenges in presentations and the introduction of a new AI and robotics program, followed by a presentation from **Geoffrey William Hoon** on AI's strategic implications for global security and governance. The group subsequently explored telecommunications and internet-governance standards, with **Dr. Richard Hill** providing historical context on the evolution of the **International Telecommunication Union (ITU)** and current industry challenges. The session concluded with perspectives on investment landscapes and future economic scenarios, including AI trends and the evolving role of humans working alongside AI, followed by demonstrations of AI tools for meeting transcription and summarisation. **Prof. Davit Sahakyan** spoke as the third featured presenter.

Geoffrey William Hoon: AI, Power, and Responsibility

Geoffrey William Hoon, former UK Secretary of State for Defence, is a British statesman whose career spanned both Westminster and Brussels. A barrister and academic by training, he served as a Member of the European Parliament from 1984 and entered the UK House of Commons in 1992. His ministerial roles included Secretary of State for Defence, Leader of the House of Commons, Secretary of State for Transport, and Minister for Europe. His tenure intersected with major post-9/11 security decisions and debates on intelligence use, the UK's nuclear posture, and transatlantic cooperation.

In his address, Hoon framed AI as a force multiplier—and a potential autonomous decision-making actor—in future security architectures. He stressed the urgency of embedding democratic values, accountability, and transparency into AI systems used by governments and the military. He argued for international norms and treaties to pre-empt militarisation and unchecked weaponisation of AI, which could destabilise power balances and amplify global risks.

Beyond security, Hoon addressed AI's socio-economic footprint, particularly in labour markets. He called for proactive education and retraining to ensure human capital evolves alongside machine intelligence, fostering human–AI collaboration rather than displacement. The session positioned AI as a test case for 21st-century governance, diplomacy, and strategic foresight.

Dr. Richard Hill: Global Telecommunications Governance

Dr. Richard Hill, President of the Association for Proper Internet Governance (APIG), offered a strategic overview of the fragmented, often contradictory landscape of global telecommunications and internet governance. He highlighted a core paradox: while physical technologies such as Wi-Fi adhere to global standards, dominant platforms (e.g., messaging services) operate in regulatory grey zones, thriving without formalised governance. Hill traced these disparities to historical legacies and geopolitical competition, noting that control of communication infrastructures has long been a lever of strategic advantage—essential context for assessing regulatory risk and investment stability in the digital sector.

ITU's evolving role

Founded in 1865, the **International Telecommunication Union(ITU)** began as the first multilateral treaty organisation standardising telegraphy. Hill charted its transformation—from harmonising telephony pricing to regulating wireless spectrum and coordinating satellite orbits. He noted, for example, how the Titanic disaster catalysed U.S. engagement in global radio regulation, reshaping the ITU's mandate. Today, the ITU navigates complex challenges such as satellite mega-constellations, working through national jurisdictions to manage orbital and frequency coordination amid accelerating space-industrial expansion.

Standards, sovereignty, and the internet

Hill outlined the geopolitical history of network standardisation, spotlighting ISO, IEC, and ITU. The U.S. deregulation

wave of the 1980s dismantled AT&T's monopoly, ushering in competition while cementing U.S. technological influence as TCP/IP (developed under the U.S. DoD) became the internet's backbone. As commercialisation advanced, the ITU's role in internet governance diminished, raising questions about sovereignty, multistakeholderism, and the erosion of global consensus mechanisms for digital infrastructure.

Financing models and liability gaps

Hill critiqued current internet economics, dominated by data-driven advertising models and limited public accountability. Unlike traditional telecoms with universal-service mandates, technology platforms often sit beyond comparable obligations. He called for greater regulatory harmonisation, particularly in mobile standards where pricing and quality vary sharply by region. Drawing an analogy to the Gilded Age railroads, he warned of increasing concentration among tech conglomerates and pointed to a persistent software-liability gap: critical infrastructure frequently depends on systems shipped with known vulnerabilities yet few legal guarantees. With AI regulation now on diplomatic agendas, he cautioned that growing regulatory pressure and geopolitical friction are likely to reshape the digital investment landscape.

* * * * *

Dr. Philipe Reinisch&Prof. Davit Sahakyan: Global Investment Trends in AI

Dr. Reinisch introduced**Prof. Davit Sahakyan**,a senior executive with 25+ years of cross-sector leadership, specializing in driving digital finance, innovation ecosystems, and strategic

transformation in emerging markets. He served as Armenia's Deputy Minister of High-Tech Industry, where he led national digital finance strategies, startup acceleration policies, and international tech diplomacy with 25+ governments and global companies.

Dr. Sahakyan provided a data-driven overview of global investment trends shaped by deep tech, AI, and geopolitics, emphasising innovation's central role in economic resilience. In 2024, global startups reportedly raised $333 billion in venture capital, with AI capturing a record share. The United States, China, and the UK led investments; sectors such as generative AI, deep tech, and healthtech drew particular interest. AI-specific funding rivalled other technology segments, with multi-billion-dollar raises (e.g., OpenAI, Anthropic, xAI). Executives and investors pointed to AI agents, multimodal AI, and intelligent cybersecurity as near-term drivers. Robotics, propelled by AI, accelerated—with major firms and startups unveiling advanced prototypes.

Rising compute demand renewed interest in nuclear energy for sustainable power, with several technology companies exploring SMRs (Small Modular Reactors) and AMRs (Advanced Modular Reactors). Looking toward 2030, Dr. Sahakyan highlighted five technologies likely to transform daily life: **programmable materials**, **quantum computing**, **genome therapy**, **artificial general intelligence (AGI)**, and **hyperconnectivity**. His strategic takeaway: countries and firms should align investment, innovation, and policy to foster sustainable growth—building deep-tech ecosystems, forming innovation corridors, and leveraging public–private partnerships. He stressed that AI should be treated as a co-intelli-

gence partner, with human agency remaining indispensable in ethics, strategy, and leadership.

Dr. Reinisch complemented these insights with an analysis of the structural transformation of education—from "just-in-case" knowledge to "just-in-time" adaptive learning. He argued that AI is reshaping entry-level work and that education systems must prioritise continuous re-skilling and cognitive agility.

AI tools in practice

Dr. Philipe Reinisch, founder and director of **SILKROAD 4.0**, also demonstrated AI tools for meeting enhancement—covering transcription and summarisation workflows (e.g., **Fathom AI**) and research/generation platforms (e.g., **Perplexity**, **ChatGPT**). He discussed model selection, deep-search capabilities and limits, cost considerations (including practical payment options), and the value of customising ChatGPT to improve responses over time. The session closed with a reminder about copyright when using AI-generated images in presentations and publications.

Samir Mujkovic is an ICT Expert and System Analyst with international experience in ICT Development, Design and Project management, over the last 40 years.

3.5 The 5th Session

Smart Production in the Connected World
Rapporteur: Kamila Bogdanova

Can artificial intelligence predict and prevent diseases before clinical symptoms appear? Will smart factories balance automation with safe human–robot collaboration? How close are we to AI-managed air travel and single-pilot cockpits? These questions guided the 5th session of the global course "Understanding AI & Robotics: Their Multi-Dimensional and Multi-Spatial Implications for the Public and Private Sector," held on 19 June 2025 under the title "Smart Production in the Connected World."

Spanning the fields of medical technology, industrial manufacturing, product engineering, and aviation, the 5th lecture brought together three distinguished experts: **Dipl.-Ing. Davul Ljuhar**, founder of BRAINCON Technologies; **Captain Rehan van Tonder**, CEO of Shift Aviation Solutions and Boeing 777 pilot; and **Dr. Sebastian Schlund**, Head of the Institute of Production Engineering at TU Wien.

Framed by topics such as Industry 4.0, AI-powered logistics, healthcare prediction models, and safe aviation, the session offered participants both practical insights and critical reflections on what smart production truly demands in an increasingly connected world.

AI for Healthcare and Infection Control

Dipl. Ing. Davul Ljuhar delivered a lecture on the applications of AI in healthcare diagnostics and infection control. Drawing from decades of professional experience in high-tech industries and medical engineering, Ljuhar detailed two main areas of his expertise and work: AI in predictive diagnostics of bone-related diseases and AI in the control and prevention of hospital-acquired infections.

His presentation unfolded along two application pathways: predictive diagnostics and infection prevention.

Ljuhar began his presentation by reflecting on his initial encounter with AI, which took place in 1987, during his research on the use of expert systems in mechanical design. He later founded BRAINCON Technologies and redirected his focus to the assessment of bone diseases, specifically osteoporosis. In collaboration with French researchers, Ljuhar's team shifted from bone density to bone quality as the primary indicator of bone health. They used fractal dimension analysis to assess bone structure, establishing a methodology to evaluate the quality of bone tissue. This required large datasets and clearly defined ground truth standards.

In a retrospective study (2012–2018) covering 7.4 TB of data and 7,000 patients in San Francisco, his team identified early structural anomalies in baseline scans that preceded osteoarthritis—evidence, he argued, that AI could detect disease risk well before clinical presentation. He noted parallels in mammography, where AI systems reportedly identify pre-cancerous lesions years in advance.

From 2016 onward, Ljuhar shifted focus to nosocomial (hospital-acquired) infections. He emphasized the global urgency of this issue, citing an estimated 36 million annual deaths due to such infections, with a projected increase to 170 million by 2050. Ljuhar identified a need for systems that combine software and hardware to support hospitals in disinfection and outbreak prevention.

A significant challenge lay in the diversity of available data, which often lacked compatibility. Ljuhar illustrated this with an analogy: translating technical data from German to Chinese and back again resulted in inconsistent information. His team worked to harmonize and structure this data by identifying correlated data clusters. They defined four initial data groups to analyze environmental factors such as humidity, temperature, and chemical concentration (e.g., hydrogen peroxide) in hospital settings.

Using convolutional neural networks (CNNs), his team developed algorithms capable of predicting effective germ inactivation strategies. Ljuhar highlighted the potential of reinforcement learning and cognitive systems in future infection control, anticipating AI-supported systems that could adapt and improve based on environmental data and past performance.

He referenced a current case in Kenya, where hospital infection rates contribute to 32% infant mortality among newborns. According to Ljuhar, such AI systems could significantly lower infection-related deaths and costs, which are expected to reach over $200 billion by 2050. In Austria alone, 140,000 cases of nosocomial infection are reported annually.

Ljuhar concluded by stating that his company's pilot sys-

tems would be tested in hospitals starting later this year. He stressed that AI could provide meaningful support in global healthcare management and serve as predictive tools for both chronic diseases and public health crises.

AI in the Aviation Sector

Captain Rehan Van Tonder, CEO of Shift Aviation Solutions Group, a former Boeing 777 captain and instructor, introduced the foundational structure required for operating an airline, emphasizing five essential components: physical hardware, human software, an operational base, financial support, and legal authorization. He underscored that the current aviation model faces persistent inefficiencies. These include long wait times for check-in, boarding, and immigration processes. According to Van Tonder, AI can directly address these inefficiencies through automation and predictive planning.

His intervention focused on three interconnected layers: operational efficiency, cost structures, and human oversight.

Van Tonder highlighted how third-party services are set to revolutionize passenger logistics. AI-powered drones could transport baggage directly from a passenger's home to the aircraft. Biometric verification systems, already in use for passport control, are likely to eliminate the need for physical boarding passes. Wearable devices like smartwatches will soon enable biometric identification from check-in to boarding. These advancements will streamline the entire passenger journey.

Rehan Van Tonder stressed the vast volume of operational data transferred between aircraft and systems such as flight

planning, maintenance, and checklist management. He emphasized that AI could translate this data into actionable insights, enhancing cognitive support for human operators. AI will reduce pilot errors by filtering and prioritizing information in high-pressure scenarios.

He presented a model for future flight decks, which may involve single-pilot operations. AI systems would take on procedural and emergency functions, leaving the pilot to supervise and intervene in exceptional cases. In the long term, pilotless cockpits might become feasible, although safety protocols and insurance frameworks remain barriers.

Responding to a question about operational costs, Van Tonder explained that pilots contribute roughly 10% to an airline's overall expenditure, with hardware, software, and fuel costs each constituting about a third. Automation could reduce the number of pilots needed on long-haul flights, generating cost savings without compromising safety. Cabin crew responsibilities will also evolve, with AI-enabled robots managing non-critical tasks like food and beverage service, while humans focus on safety and security.

Van Tonder anticipated future developments in AI-human interaction. Wearable cognitive augmentation devices could monitor pilot stress levels in real time. Ethical questions arise: who owns the data collected from a human's brain activity? Will cognitive ability disparities lead to inequality in interfacing with advanced systems? He warned of potential consequences if AI systems malfunction or behave unpredictably. AI oversight mechanisms must ensure fallback options, such as remote piloting, remain viable.

In his presentation Van Tonder introduced some innovations developed by his company, including AI software that sequences aircraft arrivals to minimize holding patterns and reduce delays. This approach could eliminate the need for costly airport expansions. He cited the example of Montenegro, where his company's software projected annual savings of over 70 million euros. These solutions aim to optimize existing infrastructure, reduce CO_2 emissions, and increase the efficiency of resource use across the aviation ecosystem.

Van Tonder also addressed concerns about radiation exposure in aviation. He cited peer-reviewed research showing varied outcomes but confirmed that exposure does exist, especially for flight crews. Airlines monitor solar activity and adjust flight paths to mitigate risk. The implementation of AI may allow real-time radiation monitoring and further reduce health risks.

In closing, AI was framed as a lever for safer, more efficient, and more sustainable aviation—able to sharpen decisions, reduce error, and streamline operations—so long as ethical, legal, and infrastructure gaps are addressed.

The Rise of Humanoid Robotics in Industry

Dr. Sebastian Schlund brings decades of expertise in industrial engineering and human-machine interaction. He has held academic and leadership roles at the University of Stuttgart and Fraunhofer IAO and currently leads applied research at TU Wien. His current work focuses on the interface between robotics, production processes, and human-centered system design.

Sebastian Schlund began his lecture by outlining the historical trajectory of humanoid robotics. Early milestones included Electro, a remote-controlled robot built in 1939 by Westinghouse, and Japan's WABOT-1 in 1973, capable of basic walking and gripping. These early efforts laid the groundwork for today's more sophisticated humanoid systems, which now benefit from modern AI technologies. Recent advancements by companies such as Tesla (Optimus), Boston Dynamics (Atlas), and Agility Robotics (Digit) have shown the potential of humanoid robots in performing simple, structured tasks. However, Dr. Schlund emphasized that these demonstrations remain mostly confined to controlled settings and are not yet robust enough for widespread deployment.

Dr. Schlund highlighted the critical role of advanced AI and simulation platforms in recent progress. Tools developed by NVIDIA and OpenAI, for instance, allow developers to simulate robotic movement and learning in virtual environments before transferring these capabilities to physical robots. This simulation-to-reality pipeline has accelerated the development process and reduced costs.

Still, challenges persist. The physical limitations of hardware—especially robotic hands or end effectors—represent a major bottleneck. State-of-the-art five-fingered robotic hands can cost upwards of €20,000 to €30,000 per unit. Despite their mechanical sophistication, these tools still lack the flexibility and responsiveness of human hands, particularly when interacting with soft or deformable materials.

Human-Robot Collaboration and Future Trajectory

Dr. Schlund underscored the importance of designing col-

laborative robotics systems. He argued that humanoid robots should not aim to replace human labor but rather to support workers in environments where ergonomic stress or safety risks are high. In his view, true productivity gains will emerge not from automation alone but from balanced cooperation between humans and machines.

Looking forward, Dr. Schlund projected a realistic timeframe of about 10 years before humanoid robots could see large-scale deployment in industry. This will require not only technological refinement but also adaptation of workflows, regulatory frameworks, and workforce training.

Kamila Bogdanova of Charles University, for the past decade has served as the senior researcher with the IMD, GlobSec, IFIMES, and currently with the GAFG.

3.6 The 6th session

Beyond the Soul of AI: Art, Ethics, and the Future of Human Expression
Rapporteur: Nasya Aiskha Safira

On June 26, the weekly Understanding AI & Robotics training program held its sixth session, where participants explored the impacts and implementations of AI in Hollywood, filmmaking, visual arts, and media from industry experts' perspectives. The sixth session brought together **Igor Ridanovic**, a post-production specialist from Hollywood Studios, **Svjetlana Ceca Bukvich**, a CEO of New York Music studios, and **Eva Petric**, a conceptual artist working between New York, Vienna, and Ljubljana.

How AI is changing Hollywood

The session began with **Igor Ridanovic**, who started the discussion with a presentation of *Behind the Scenes: How AI Is Changing Hollywood,* covering people and culture themes. He outlined where Hollywood stands in AI adoption with three points: where AI is used, what works and what does not, and the ethical/legal crossroads.

Post-production represents the final stage in the filmmaking process, occurring after the television show has been filmed. During this phase, all the individual components are assembled and refined to create the completed work. The software tools Ridanovic created for media and entertainment connected him to the world of AI.

In Hollywood, AI is widely, if quietly, used for translation, visual effects, content analysis, and more. However, it has not yet been fully developed for end-to-end film generation. Hollywood is central to the AI discussion for three reasons: its economy-scale output; its history as an early technology adopter; and its cultural influence as a source of soft power.

AI tools are commonly used for object removal, speed changes, facial isolation, and similar tasks. Yet post-production is not capable of delivering fully AI-generated films at Hollywood standards, and studio experiments have not produced major deployment breakthroughs.

AI is also divisive. Legal and ethical concerns, especially copyright, raise questions about authorship and the creative process, and may shape business decisions. AI could alter the nature of screenwriting and other creative roles.

The production process generally consists of development, pre-production, production, and post-production. While content distribution is not a formal stage, it is critical to reaching audiences. Visual effects (VFX) span multiple phases and contribute significantly to the final product. Pre-production, production, and post-production are especially technology-driven; accordingly, AI is focusing on enhancing these areas.

Many tools in the film industry have long incorporated machine-learning techniques, even before they were labeled "AI." Early uses in other industries in the 1980s–1990s laid the groundwork for today's rapid development. Earlier technologies lacked the sophistication and accessibility to produce high-quality, end-to-end AI video; fully AI-generated video was rare before advanced models emerged.

AI is increasingly integrated into VFX workflows, enabling more efficient creation of complex effects. One application is AI-powered lip-sync, which streamlines localization. Ridanovic demonstrated a proof-of-concept translating dialogue and synchronizing lip movements for multilingual content. Similarly, the Swedish film *Watch the Skies* used AI to align actors' lip movements with dubbed English dialogue, improving accessibility for international releases.

Tools such as **DeepMind's Veo** and short films like *Ancestra* are central to ongoing experiments. Concerns persist about training data, which reportedly includes unlicensed material. Under the current stance of the **U.S. Copyright Office**, content generated solely by AI cannot be copyrighted, underscoring legal and ethical challenges.

Public perception often views AI as a threat to traditional jobs, including in filmmaking. The industry is in a transitional phase. Many advances are supported by subsidies and research efforts. Despite hype, creating a fully AI-generated short film still requires substantial R&D and iterative refinement. A strong foundation in traditional filmmaking remains essential to leverage AI effectively.

Artistic explorations of AI

The next speaker, **Eva Petric,** is a transmedia artist working across photography, video, sound, performance, scent, and installation. She is interested in how collective views are formed. While she values the capacity to work with AI images, she also notes a destructive side, because art connects us to what it means to be human.

Petric argued that the creation of art is rooted in emotional depth and human sensitivity. Excessive reliance on AI in artistic processes risks dulling this sensitivity and could lead to what she called a *"collective dementia."* Yet technological advancement is intrinsic to human progress; rather than resisting change, we should engage with it thoughtfully and responsibly.

Her work often embodies human perspectives, emotional awareness such as love and hate, expressed through installations that use materials to connect and catalyze. She uses lace fabrics whose mathematical patterns, when layered, evoke the interconnectedness of the universe. She integrates science, space imagery, and human presence, using technology (including satellite data) while emphasizing human creativity and vision.

Art continues to provide a space for human connection, ritual, and presence, prompting fundamental questions: Is this for the good of humanity? Petric expressed hope that art will keep reaching broader audiences and urged that technological advancement not dilute our humanity.

Imagination, she argued, is not yet fully understood and needs the freedom to create beyond existing material. While AI can generate and mimic nature, it risks overlooking the humility owed to the natural world—an intelligence older and deeper than our own. Pushing too far without reflection may lead to a dead end or a singularity in which something vital is lost. As long as art exists, it affirms and preserves what it means to be human.

Bad, worse, catastrophic

Dr. Harvey C. Dzodin was in dialogue with Dr. Philipe Reinisch. A political appointee in the Carter administration, longtime ABC vice-president in New York, and now a global media commentator, Dr. Dzodin reflected that truth, never easy to discern, was simpler in the late 1970s. With the arrival of the World Wide Web in the 1990s, knowledge shifted from scarcity to overabundance; attention became the scarce commodity.

He argued that matters had progressed from bad to worse to catastrophic with generative AI, where information, misinformation, and disinformation intertwine and are hard to distinguish. Algorithms splinter society into tribes that do not communicate, while malevolent uses of AI become easier, affecting elections and public decision-making. Governments are failing to regulate advanced AI—echoing challenges seen with cryptocurrencies and fintech—a dynamic sometimes called the Collingridge dilemma (technology becomes harder to regulate as it matures).

Given this, he urged ethical frameworks, public education, and better detection systems for AI-generated content, espe-

cially around elections and media. He called for interdisciplinary dialogue among technologists, artists, and ethicists, and for further sessions to examine specific AI applications and impacts. Collaboration is essential to address AI's negative aspects. While severe consequences have not fully materialized, there is shared hope that cooperation can deliver constructive solutions.

Nasya Aiskha Safira of the Gadjah Mada University, Indonesia, is a Jakarta-based Information Officer of IFIMES (Department for Strategic Studies on Asia).

3.7 The 7th session

Mental Health, Innovation and the Politics of Space in the Digital Era
Rapporteur: Tetiana Kyryienko

By the seventh session of the Understanding AI & Robotics program, the conversation expanded beyond technology to examine mental health, urban innovation, and the future of human interaction in increasingly digitalized environments. From the outset, the program aimed to bridge the gap between innovation and implementation, enabling both public- and private-sector actors to anticipate, interpret, and act on AI's rapidly evolving implications for socio-economic development, politico-military balance and security, and for a just global order grounded in firm rules and principles.

In the 7th session, **Dr. Kat Zarychta,** a leader and mentor with two decades of experience in business development, innovation, and healthcare, argued that AI cannot replicate empathy. As digital therapy tools rose in popularity, she warned against what she called "illusory intimacy," the mistaken belief that bots could replace the healing power of human connection.

She emphasized ethical design, transparency, and the need to ground digital interventions in authentic emotional care.

Following her, **Dr. Jan Banerjee**, an urban researcher at the

Vienna University of Technology, delivered a wide-ranging lecture on urban innovation and knowledge cities. Drawing on history, architecture, politics, and planning, he described cities as "political artifacts," ecosystems shaped by negotiation, diversity, and friction among social interests. His key messages were that cities function as platforms for continuous innovation and problem-solving; that physical proximityand face-to-face exchange remain essential to innovation; and that spatial design must engage with the political nature of cities rather than only with technological efficiency.

Central to his lecture was the idea of cyber-physical landscapes,environments where the physical and digital interact. Using his "data pump" model, he illustrated how platforms like Airbnb capture data, process it through algorithms, and return services to the physical world. Such platforms, he argued, are new infrastructures for modern cities, actively shaping how people live, work, and move. Despite advances in virtual technologies, he insisted on the irreplaceable role of proximity, citing examples from early 20th-century Vienna to Silicon Valley and Nairobi's AI hubs. Serendipity happens in cities—in cafés, on sidewalks, in unexpected encounters. Virtual spaces could enhance but not replace the creative power of urban life.

The session also explored real-world examples of innovation, from Kigali's Carnegie Mellon-backed innovation center to Hangzhou's Future Sci-Tech City and hybrid virtual-physical

networks responding to global shifts. A discussion on de-urbanization and remote work followed; without dense human interaction, Banerjee cautioned, innovation may stagnate. Participants debated the role of VR in future cities, the ethics of platform-based governance, and how to balance digital access with urban equity.

Tetiana Kyryienko, international expert in human capital strategy, strategic communication and organizational development, with a Master's degree in International Business.

A Journey Through Digital Mental Health:
Navigating Technology, Culture, and Care
Rapporteur: Dr. KaT Zarychta

We live in a world where screens are our constant companions—where a tap connects us to millions, yet leaves many feeling more isolated than ever. As we race to innovate with AI and digital tools, a critical challenge emerges: Are we nurturing the human mind—or risking its well-being?

This question opens a necessary journey through the landscapes of technology, culture, and mental care. The goal is not just to illuminate the evolving realities we face, but to awaken a collective awareness around how these forces intersect, impact, and shape our psychological health worldwide.

To care for the mind in the digital era, we must first understand it. Despite decades of neurological advances, the human mind remains one of our deepest mysteries. It is not just neurons firing or information being processed. It is a dynamic ecosystem of thought, emotion, memory, and—perhaps—something spiritual that science still cannot fully quantify.

Unlike artificial intelligence, which digests massive datasets and relies on mechanical precision for narrow tasks, the human brain performs exquisite cognitive feats with remarkable efficiency. A single lived moment—joyful or traumatic—can

forever reshape a person's mindset. This ability to learn, generalize, reflect, and feel is what separates us from machines. The brain consumes roughly 20 watts of energy—a dim lightbulb—yet outperforms even the most advanced AI in adaptive intelligence, creativity, and emotional understanding. AI, operating on nanosecond speeds and defined rule sets, is powerful, but lacks something essential: consciousness, subjective experience, empathy. Its utility in specific domains—like image recognition or data sorting—often vastly surpasses that of humans. Still, it cannot reason with human nuance, it cannot feel love or grief, nor can it genuinely care about the outcome of a therapeutic session. The conclusion is clear: AI is not a replacement for the human brain, but a reflection of its outer architecture. Built to assist, these tools hold promise only if used as extensions—not substitutes—of human connection.

The Global Mental Health Crisis, Amplified by Screens

Mental health is now one of the most pressing global health crises of our time, a crisis amplified by "screens". The World Health Organization defines mental health as "a state of mental well-being that enables people to cope with the stresses of life, realize their abilities, work productively, and contribute to their communities." It is not binary. It exists on a spectrum—and it is an essential human right. Yet, today, nearly one in eight people worldwide live with a mental health condition. Depression affects 264 million people and is the leading cause of disability. Anxiety disorders impact 301 million more. In the U.S. alone, 20% of adults experience mental illness each year—yet fewer than half receive treatment.

What makes this crisis worse is the role new digital habits play in amplifying mental distress. From social media overstimulation to the pressures of remote work life, technology has radically transformed the terrain of mental health—for better and worse.

The Digital Dilemma: Connected, Yet Alone

We check our phones 159 times per day. We spend over 2 hours and 24 minutes daily on social media. And yet, many report growing feelings of loneliness, disconnection, anxiety, and sleep dysfunction. Nearly 70% of adults claim screens disrupt their sleep. 41% of Gen Z report feeling worse after using social media. Depression among young women has risen by 50%, strongly linked to online comparison and self-esteem issues.

This paradox can be termed "Connected Isolation": we are continuously online, yet internally distanced—from each other, and from ourselves. The algorithms designed to engage us often end up draining us—intellectually, emotionally, even spiritually.

Digital Tools: Therapy or Threat?

In response to mental health needs, the digital world is offering something new: digital therapeutics. From mental health apps like Calm, Woebot, and Headspace, to AI-driven therapy bots and wearable mood trackers, these tools are now part of a booming $8.5 billion dollar industry—on track to become $36 billion by 2034. The promise is real. These tools have potential to democratize mental healthcare, reduce stigma, and reach populations often excluded from traditional support.

For overworked professionals or those in remote areas, 24/7 app support can be life-changing.

A cautionary note is essential: function must not be mistaken for empathy. AI cannot feel. And often, its understanding of human emotion is artificially mimicked. A therapy bot cannot offer real compassion in crisis. Misdiagnoses, data privacy breaches, and over-reliance on tools without human oversight are already becoming common.

Worse, many platforms collect deeply personal mental health data—with little transparency about how it's stored or used. In some cases, user data is mined and sold for commercial gain. This raises an essential ethical question: who owns our inner world when it becomes digitalized? Beyond functionality, another urgent issue is bias in AI systems. AI tools trained on limited, Western-centric data sets often misinterpret expressions of emotion across other cultures. A Black woman's neutral face might be labeled "angry." Cultural grieving practices from Lagos, Mumbai, or Manila might be flagged as abnormal by systems never trained to recognize them. When such systems are exported globally without proper adaptation, they create a new form of digital colonialism—where Western-designed tools evaluate and intervene in emotionally complex behaviors they don't fully understand. This is not simply a flaw in coding—it is an ethical failure. Without inclusivity in data and developers, we risk embedding discrimination into the very tools meant to heal.

Another rising concern is AI as an emotional companion and "The Illusion of Intimacy". Apps like Replika and "AI girlfriends or boyfriends" have cultivated virtual relationships—simulated empathy and conversation. But these exchanges

risk becoming substitutions for real connection. This is the "Illusion of Intimacy"—a growing dependence on interactions that feel safe, controlled, and nonjudgmental, but which ultimately lack real emotional resonance. These AI friends cannot challenge us, comfort us deeply, or inspire meaningful personal growth. Used excessively, they might even reinforce unhealthy attachment patterns and deepen isolation.

Burnout and Cognitive Decline in the Digital Age

New international data suggests that our constant engagement with digital tools may be impairing our brain function. Since around 2010—coinciding with the rise of the smartphone—the average human capacity for novel problem-solving and sustained attention is declining. This isn't just a generational trend—it's a public health concern. Sleep deprivation, mental fatigue, and constant information bombardment may slow cognitive development, especially in children. The burdens are overlapping: children face cyberbullying and screen overload, professionals face digital burnout, and the elderly experience digital exclusion.

Digital Mental Health Across Demographics

Despite the risks, technology—when designed ethically and intentionally—can be a powerful ally.

- **Youth**: Apps like Smilamind and Poppins support digital well-being and neurodivergent kids.

- **Women**: Clue and Stella help track hormonal moods and menopause support.

- **Older adults**: GrandPad and Virtuleap bring cognitive stimulation and connection to aging populations.

- **Clinicians:** Iluria and Thera-Link support therapist burnout management and remote practice efficiency.

Properly harnessed, digital tools can offer interventions tuned to the real-life challenges of diverse groups. The goal is not to reject technology—but to co-create with it responsibly. Three guiding pathways forward are critical:

- **Human-Centered Design:** Mental health tools must be culturally attuned, ethically guided, clinically well-researched, and adaptable to user diversity.

- **Systemic Change:** With only 2% of global health budgets going to mental health, funding must increase. Legal protections for mental data privacy and digital equity must become norm, not exception.

- **Individual Responsibility:** Each of us must check our digital consumption. Are our screens a source of stress or sanctuary? We must choose connection over distraction, and stay active in protecting our mental health ecosystems.

The Mind is Sacred

A final reminder transcends trends and technology: "The mind is not a product. It is not a dataset. It is a living, feeling, dynamic miracle. Let us protect it as such." The road ahead requires collaboration—not just of developers and clinicians, but of educators, policymakers, families, and everyday digital citizens. We need less acceleration for innovation's sake, and more intention for wellbeing's sake. We must be wise stewards

of our tools. We must choose empathy over efficiency, community over code, and wholeness over data. Because the future of mental health is not in the hands of machines—but in the hearts of those who design, use, and care for them. This is a critical moment in our collective journey—a reminder that while digital life is here to stay, the wellbeing of our inner life must never be sacrificed.

Dr. KaT Zarychta is a globally recognized leader, mentor, and coach with over two decades of experience in business development, innovation, and healthcare solutions. She is an EU Expert Advisor and Mentor specialized in innovation, strategy and Artificial intelligence. Renowned for her ability to connect deeply with individuals and inspire transformative growth, she has dedicated her career to fostering human-centric strategies that empower entrepreneurs, innovators, and organizations worldwide—particularly within the biomedical and healthcare industries.

Urban Innovation, Digital Platforms, and the Future of Cities

Rapporteur: Ian Banerjee

Introduction

Innovation will play a pivotal role in shaping the cities of tomorrow. To create locational advantage and thrive in the twenty-first century, cities must cultivate the capacity to solve problems, innovate, and foster continuous learning within their institutional and social systems.

While discourse on urban innovation has circulated for more than a century, the platformization of cities—a process driven by powerful entities known as digital platforms—is a comparatively recent development. Digital platforms increasingly shape everyday life and, in doing so, prompt us to reimagine not only the broader trajectories of urban futures but also how urban innovation can be conceived, organized, and enhanced.

Despite the vast amount of research done on urban innovation, its insights have not fully permeated the planning bureaus of governments or the meeting rooms of policymakers. Innovation - frequently described as one of the most critical challenges of our time - has yet to meaningfully influence many of the actors responsible for shaping cities. At the same

time, digital platforms are reshaping urban landscapes in ways that remain difficult for both public officials and planners to fully comprehend.

This essay explores the emerging and complex relationship between urban innovation and the platformization of cities. Its aim is to offer recommendations for policymakers and city administrations on how to build more inclusive governance models capable of enabling diverse forms of innovation. While it does not claim to provide definitive answers to this vast and evolving field, it seeks to stimulate a broader conversation about the intersection between digital platforms and urban innovation.

Urban Innovation

Across millennia, certain places—Athens, Florence, Silicon Valley, Hangzhou—have experienced periods of extraordinary creativity and innovation. This has raised two enduring questions for spatial planners:
a) What makes a particular region exceptionally innovative at a particular moment?
b) And how can such powerhouses of creativity be replicated?

In urbanism, the discourse on regional innovation is at least a century old. Extensive research around concepts such as *industrial districts*, *territorial innovation*, *knowledge cities*, and *creative milieus* demonstrates a growing conviction that **space itself must possess particular social, cultural, and institutional qualities for innovation to flourish**. Simply injecting funding into a region does not create innovation.

Where technological innovation often focuses on investments, production processes, R&D, and business models, **urban innovation seeks to identify the socio-spatial conditions** that enable actors to generate locally meaningful innovations. These extend beyond economic growth to include social cohesion, equity, environmental protection, education, and health.

A century ago, Alfred Marshall famously described the elusive "industrial atmosphere," emphasizing how tacit knowledge, informal networks, and face-to-face interactions underpin innovative regions. This understanding later became central to the study of innovation clusters and creative milieus.

Henry Etzkowitz and Loet Leydesdorff: The Triple Helix Model

Two emblematic innovation frameworks are the *Double Helix* and *Triple Helix* models. While the Double Helix focuses on a more linear interaction between two main actors, such as *University-Industry* or *Industry-Government* relations, the Triple Helix model introduces a more dynamic, multidirectional process of innovation involving:

- **Universities (academia):** generates new knowledge, creates human capital, engages in entrepreneurial activities (e.g. through spin-offs, science parks etc.)

- **Industry (business/private sector):** commercializes knowledge into products and services

- ***Government (public sector):*** provides regulatory a framework, policies, regulation, funding, and acts as mediator or "innovation organizer"

- ***Overlapping spheres:*** The key feature is the overlapping and interaction among the three, leading to the creation of hybrid organizations (e.g., technology transfer offices, incubators, cooperative research centers).

- **Non-Linear dynamics:** The interaction among three elements makes the system dynamic and self-organizing, generating new options and allowing for transitions between different innovation trajectories.

- **Recursive selection:** Each actor influences and selects from the others' developments, leading to a complex and evolving system capable of continuous innovation.

- **Regional planning:** This model is widely used as a framework for policy-making to actively foster regional innovation ecosystems, as seen in examples like Silicon Valley (Stanford University, defense industry) and Route 128 (MIT).

Innovation, as Kline and Rosenberg (1986) argue, is not linear but emerges through overlapping feedback loops and unpredictable leaps.

Charles Landry:
Culture-driven development in the Age of AI

Unlike technocratic or entrepreneurial models, Charles Landry foregrounds *culture* as the engine of innovation. His notion of the **creative milieu** describes a setting where a critical mass of diverse actors interact in open, cosmopolitan environments that spark new ideas, institutions, and practices.

His practice was built on the notion of a 'creative milieu' envisioned as "*a physical setting where a critical mass of entre-*

preneurs, intellectuals, social activists, artists administrators, power brokers or students can operate in an open-minded, cosmopolitan context and where face-to face-interaction creates new ideas, artefacts, products, services and institutions and as a consequence contributes to economic success". ("The Creative City", Charles Landry 2000:133)

Even as AI increasingly permeates urban systems - human creativity, collaboration, and place-based cultural life remain indispensable. Landry's vision of culture-led innovation offers valuable inspiration for rethinking cities in the age of AI. In this context, the role of cities will be to attract talent by providing social, cultural, and spatial infrastructures that nurture creativity—spaces for interaction, learning, experimentation, and cultural exchange.

Digital Platforms

Nick Srnicek (2017) defines digital platforms as *"digital infrastructures that enable two or more groups to interact"*, positioning themselves as intermediaries between users, advertisers, producers, suppliers, and even physical objects. This matching of supply and demand through sophisticated data processing has produced one of the most disruptive socio-technical transformations of the century.

Digital platforms are reshaping the fabric of cities, creating new economies and modes of interaction that transcend traditional infrastructure. Platform-based marketplaces expand the reach of local retailers and service providers; residents benefit from personalized services across commerce, mobility, healthcare, education, and entertainment; and hybrid

learning and digital news ecosystems redefine civic information flows. Housing platforms influence rental markets and transparency, while digital health services bring diagnostics and medical advice directly into homes.

Together, these platforms constitute **a new urban layer**—operating across devices, algorithms, and data networks—fundamentally transforming how people live, work, move, and connect. Digital platforms have become the *new infrastructures* of cities, re-engineering economies, governance, and private life across both developed and developing countries.

Platform Urbanism

Countless online platforms have started to reconfigure services, everyday life and urban space in fundamental ways. The form of urbanism these entities have begun to instigate has been termed by academics as "*platform urbanism*". Sarah Barns, a prominent voice in platform urbanism research, distinguishes "*platform urbanism*" from the top-down, government -led "*smart city*" approach (Barns, 2018). She describes platform urbanism as a more organic, incremental, and highly political process, driven by a range of different actors whose entanglement creates the city through their daily interactions with platforms. She argues that the resulting data, of all our mundane activities, such as shopping, commuting, socializing, our "*tags and likes and clicks and views*", are brought down by "the cloud" and territorialized in physical urban experiences, fundamentally changing how we move through and experience urban space.

"Data Pump": The Invisible dynamics producing cyber-physical landscapes

Drawing from the growing volume of literature on platform urbanism, I have outlined a mental map of the main underlying dynamics of platformization by depicting *"a fourfold movement comprising (a) the collection of unprecedented amounts of infrastructural and personal data captured in physical and digital spaces, (b) the storage of collected data, (c) the processing of collected data to derive meaning and to simultaneously create economic or societal value out of them, and (d) feeding back the created values into the materialities of everyday life in the form of services"* (Banerjee,I. et al., 2021, p.433-434). This process of creating vast but invisible 'cyber-physical landscapes' is largely orchestrated by digital platforms, automated algorithms, and AI. (for in-depth analysis see Banerjee, I. et. al., 2021)

While platforms have greatly improved our lives in various ways, they also raise profound questions about dependency and inequality. Small businesses can benefit from global reach, but they can also become vulnerable to opaque algorithms, fluctuating fees, and monopolistic structures. And while digital platforms promise efficiency and convenience, they also introduce new forms of labor precarity, and exclusion for those without access or digital literacy. As everyday life becomes mediated by a handful of digital intermediaries, cities risk outsourcing essential functions, communication, mobility, trade, even governance (government-as-a-platform) to private platforms whose priorities may not always align with the public good. As such platforms are increasingly deployed for more complex and controversial activities such as surveillance and predictive policing, it also raises important questions about power.

Digital platforms meet urban innovation: Is civic-tech the answer?

The central question becomes: How can digital platforms—among the most transformative socio-technical systems of our time - be mobilized to support innovation within physical cities?

Promising experiments are emerging across the world at the intersection of digital democracy and *civic tech* – these are techno-political tools aimed at enhancing transparency, participation, and collective problem-solving (Cantucci et al. 2019; NESTA 2020). I have tried to answer the question posed above by researching the much applauded, large-scale 'digital social innovations' taking place in Taiwan currently. I have outlined my findings in an open-source article called "*Digital Agoras of Taiwan - Reimagining spaces for civic engagement*" (Banerjee 2023).I have shown how the country's ideals and social practices show striking parallels to the place where democracy saw its institutional inception 2500 years ago - in classical Athens. While in Athens the protocols of the democratic process were enacted in specific types of physical agoras (public spaces), Taiwan is doing this with their 'digital agoras'. I substantiate this thesis by narrating the case of Taiwan where the proliferation of a new generation of collaborative technologies subsumed under 'civic tech' (including Open Gov, Gov Tech etc.) are displaying extraordinary potential of bending the process of platformization towards a more participatory and co-creative direction.An impressive *landscape of interwoven and 'choreographed'* digital public spaces for civic engagement is now in place in Taiwan. They enable citizens to share technical expertise, take part in deliberative processes, develop proposals, provide ideas, frame

issues, solve problems, raise awareness, scrutinize proposals etc. Taiwan demonstrates how platformization can be redirected toward democratic participation rather than centralized control, offering an alternative to dystopian imaginaries of digital authoritarianism.

Conclusion

I have argued that a region's locational advantage will increasingly depend on its capacity to solve problems, innovate, and learn continuously. This capacity hinges on adaptive governance across three socio-technical components: **place** (spatial regimes), **people** (social resources), and **platforms** (digital infrastructures).

As political artefacts, cities are fields of co-existing conflicts between the regime and diverse social interests. In an era of rapid change, their success will greatly depend on whether governing institutions can cultivate a responsive culture that brings innovators from the margins into the mainstream.

Taiwan illustrates how governments and civil society can appropriate open-source technologies to create ecosystems of civic platforms to promote new types of **digital and mental spaces of participation.** Virtual spaces can significantly enhance the creative power of urban life—however, **they cannot *replace* physical environments and social ties.** Rather than just technology, it was proximity, shared practices, and dense social networks which contributed to the success of innovation clusters like Silicon Valley or Shenzhen. Therefore, investing in people, fostering proximity, and strengthening social networks will remain the central tasks for urban planners and policymakers in the decades ahead.

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Source

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Dr. Jan Banerjee, an urban researcher at the Vienna University of Technology, delivered a wide-ranging lecture on urban innovation and knowledge of cities. Drawing on history, architecture, politics, and planning, he described cities as "political artifacts," ecosystems shaped by negotiation, diversity, and friction among social interests

3.8 The 8th session

Economic Diplomacy in the Digital Age
Rapporteur: Jehanie Milky Nagon

How can the public and private sectors keep pace with the profound shifts brought by AI, robotics, and digital innovation? How can these technologies intersect with the growing need for interconnected policies and regulations across geopolitical, socioeconomic, technological, and security domains? These are complex questions that can mesmerize any curious mind—yet they demand open dialogue in this transformative era.

In the global interdisciplinary online Course, "Understanding AI, Robotics, and Its Multi-Dimensional and Multi-Spatial Implications for the Public and Private Sectors," such questions were not treated as abstract curiosities; they were grounded in digital data and real cases that require deeper understanding, attention, and proactive solutions—fundamentals for navigating today's global shifts.

The eight-week program, built around 2.5-hour intensive sessions, concluded on July 10, 2025. The final session, "Economic Diplomacy in the Digital Age",brought together professionals from multiple regions (researchers, practitioners, execu-

tives, and tech enthusiasts) and featured guests from diverse industries: **Daniele Sangion** (UniCredit Bank Austria), **Dr. Antonino Salmeri** (Space Law; Director, Lunar Policy Platform), **Dr. Syed Muntasir Mamun** (Ministry of Foreign Affairs, Bangladesh), and **Ronald Derler** (Kompetenzzentrum Digitale Wasserwirtschaft). The last session explored digital economic diplomacy, global strategy, digital finance, technology and infrastructure risk, market access, and innovation.

Deepfake dangers and the rising cost of cybercrime

The first keynote, **Daniele Sangion**, Chief Information Security Officer at UniCredit Bank Austria, opened with a deepfake video to demonstrate how threatening AI-enabled tools can be in cyberattacks, physical threats, business disruption, information bias, evolving fraud, phishing, fake identities, and broader cybersecurity risks.

Drawing on internal experience and national cooperation efforts, he painted a stark picture: cybercrime is a trillion-dollar business, comparable to the GDP of a major economy. Today, criminals misuse AI at scale—deepfake voices and identities, fake shops, and sophisticated phishing. He cited concrete cases: thousands of deepfake "shops" impersonating a bank, and cloned websites so convincing that victims entered logins and OTPs. In one awareness exercise, even colleagues were fooled during a live call by a deepfake version of himself, evidence of how easily people can be deceived. His core message: awareness is the first control measure, and it must be reinforced at every internal and external touchpoint.

Daniele Sangion stressed that there were no more silos: attacks can start digitally and cause physical consequences, or the reverse, so security must be addressed holistically. He also noted that, as part of an Austrian government–supported initiative, Bank Austria collaborates with other banks and major firms to raise public awareness about phishing, fraud, and deepfakes and to integrate fraud-awareness efforts at the national level.

Law beyond Earth: Digital policy in space exploration

The second keynote, **Dr. Antonino Salmeri,** a space lawyer specialized in the governance of space resources and lunar activities and Director of the Lunar Policy Platform, surveyed the status of lunar activities and the legal/policy elements required for prosperous, peaceful, safe, and sustainable conduct.

He emphasized that space is not the Wild West thanks to frameworks like the **Outer Space Treaty**, but specific, cooperative governance solutions are still needed to match the scale of government and commercial plans for long-term lunar operations. He presented the work of the Lunar Policy Platform, a global group developing policies and standards and advising the UN, governments, and companies. Without cooperative governance, he warned, the Moon's shared promise could become a contested domain. Law and policy, he argued, can secure a peaceful, prosperous, and inclusive future beyond Earth: *"Space law exists and provides solid foundations. There is no Wild West in space."* Yet to build a thriving lunar economy, the world also needs policies and standards**,** the Platform's core mission.

Digitalizing the invisible backbone: Water infrastructure and cybersecurity

The third keynote, Ronald Derler, CEO of the Kompetenzzentrum Digitale Wasserwirtschaft (Competence Center for Digitalization in the Water Industry), offered a rare perspective on digital transformation in critical infrastructure, with both promise and risk. A cybersecurity leader and former military/police professional with training in crisis leadership, he focused on protecting water supply and wastewater systems across Europe: this is not about going to the Moon, he said, but about ensuring clean water for millions daily.

With more than 8,000 water-related organizations in Germany alone, many operating for over a century, he argued that digital transformation is now essential to manage rising energy costs and workforce shortages. But increased connectivity means greater exposure. He pointed to real cyberattacks on water systems in Germany and Texas: legacy industrial controls and poorly governed remote access create serious liabilities. Operational technology (OT) systems, he warned, are vulnerable: *"You don't have to hack the systems; you just have to find them."*

To address these risks, Derler's team launched the Situation Center "Cybersac at Water," Europe's first industry-wide Security Operations Center dedicated to the water sector. It operates 24/7, offers specialized e-learning, and runs workshops to build digital resilience. Yet smaller utilities still struggle with legal and compliance pressures, especially amid fragile supply chains. He added that social engineering accounts for over 90% of incidents, and AI is making both attackers

and defenders more capable. His response extends beyond firewalls: adopt zero-trust principles, require software transparency, and strengthen cooperation with national security agencies. Ultimately, the challenge is as much about people, priorities, and planning as it is about tools.

From static states to fluid futures: Governance in the age of digital sovereignty

The final keynote, **Dr. Syed Muntasir Mamun,** Director General for ICT at Bangladesh's Ministry of Foreign Affairs, offered a bold, reflective narrative on the future of governance. He framed governance, imaginaries, and digital spaceas the product of over a decade of inquiry into the evolution of republics and state systems, with a focus on the Global South. He underscored that about 80% of the world's population lives in bottom-of-the-pyramid markets still experiencing institutional voids in governance, economy, welfare, and identity. Digital space, he argued, has become the core terrain of livelihoods, identities, and aspirations, no longer merely a cyber-warfare domain.

In response, he proposed the **"AAA" model, Adaptive, Agentic, and Agile,** for governance in a world of shrinking timelines. *"Ideas once projected for 2100 must now be realized by 2030,"* he said. His **Fluid Institutions** model insists that governments should serve citizens, moving away from hierarchical, slow bureaucracies toward agile, digital-first structures. He pointed to practical examples: drones for healthcare delivery in Rwanda, blockchain land registries in Ghana, and mobile money in Bangladesh reaching the poorest. The mindset shift is clear: *"Governance today is about real-time intelligence,"*

measuring trust, building legitimacy, and crafting institutional narratives that embrace digital tools and fluidity. The destination: dynamic, tech-savvy, citizen-first institutions.

Jehanie Milky Nagon is a Manila-based Information Officer of IFIMES (Department for Strategic Studies on Asia).

Afterword

When you open this e-book, you encounter concepts, case studies, and frameworks. When you stand inside the community that produced it, you encounter something else first: people who would not normally meet, trying very hard to understand one another.

I was reminded of this very strongly a few days before we finalized the manuscript, during the XXV Global Future Summit. We were connected across more than twenty cities and multiple time zones. Some participants were sitting together in Vienna, others in Hanoi, Dhaka, Singapore, Yerevan, and many other hubs; still others were following the livestream from their desks. Technically speaking, we were separated. But for a few hours, we shared one room and one conversation.

The Global Future Summit is part of a longer journey that began in a much less digital way.

In 2018, I climbed onto a high-tech motorcycle in Austria and rode along the historic Silk Road all the way to the Pole of Inaccessibility in China and back. I passed borders and checkpoints, yes—but what stayed with me were the encounters: engineers and entrepreneurs, diplomats and academics,

monks and truck drivers. I saw how much friction still exists in our world—political, cultural, technological. I also saw how quickly things can move when there is trust across those lines.

That journey eventually became SILKROAD 4.0: not a road, but a connectivity ecosystem. Instead of caravans and spices, we connect people, knowledge, and capital. Instead of one route, we work through many local hubs. The premise is simple: if we lower friction between the right people, we can unlock solutions that no single country, company, or institution can build alone.

The **Global Academy for Future Governance** (GA FG) and this "Understanding AI & Robotics" programme grew out of the same impulse. Where SILKROAD 4.0 focuses on ventures and applied projects, GA FG focuses on capabilities and governance. Together with partners such as the D-8 Organisation and the institutions represented in this book, they form different parts of one larger ecosystem.

Since that motorcycle trip, the world has not calmed down. We have watched supply chains rupture under stress.

We have lived through a pandemic that could pause entire societies in weeks. We are navigating economic uncertainty, regional conflicts, information disorder, and accelerating climate risks. On top of all this sits a new layer of disruption: the economic and political shockwave of AI—and, on the horizon, the open question of artificial superintelligence.

Behind the technical debates lies a more fundamental question: what does it mean to be human in a world where machines can increasingly simulate our intelligence, our creativi-

ty, even our conversations? What remains uniquely ours—our sense of meaning, our ethics, our capacity for empathy and responsibility, our ability to imagine a better future together?

The discussion about superintelligence is, at its core, a discussion about our better self. That is not a question any of us can answer alone. It is something we have to explore together—across cultures, disciplines, and generations—by asking not only what we can build, but who we want to become while building it.

* * * * *

A few weeks ago, at the Autumn Economic Forum in Ho Chi Minh City, I listened to Vietnam's Prime Minister, Pham Minh Chinh, in a public dialogue. His words echoed many of the themes that appear in this e-book.

He reminded us that no one is safe if one country is unsafe. In an interconnected world, security and prosperity cannot be protected by isolation. He called repeatedly for unity and renewed multilateralism—and he insisted that this begins with us, not with some abstract "other" who should act in our place. Technology, he said, must bring happiness and safety to people; people remain at the centre, and technology must assist, not replace, them.

He closed with three simple, demanding ideas:

> Unity to project strength,
> Collaboration to create strength,
> Dialogue to create trust.

For me, these three lines could serve as a quiet motto for this book.

Unity here does not mean uniformity. Within GA FG and SILKROAD 4.0 we often use a slightly different word: alignment. Unity tells us that we belong together; alignment asks where we are going and how we can move in the same broad direction without erasing our differences.

In practical terms, we think of alignment through four overlapping circles - ***the SILKROAD 4.0 connectivity framework***:

- Technology and Innovation: the engineers and creators who build new capabilities.

- People and Culture: the social scientists, educators, and community builders who help societies absorb and adapt to change.

- Global Governance and Law: the policymakers, diplomats, and institutional leaders who shape the rules of the game.

- Business and Finance: the entrepreneurs, corporates, and investors who enable solutions to scale and endure.

Most of the contributors to this e-book live in one of these circles. Some are building AI and robotic systems. Others are working on legal frameworks, public policy, or international cooperation. Others still are designing business models, funding instruments, or educational programmes. The real challenge—and the real promise—lies in the overlaps.

* * * * *

Where the***four circles*** intersect is where "connective leaders" emerge: people who can speak more than one professional language, who understand that AI is not just a technical system but a social, political, and economic force. The Certified Connectivity Specialist programme and the Academy more broadly are designed to cultivate exactly this kind of leadership.

Another speaker at that Vietnam event, Stephan Mergenthaler from the World Economic Forum, described five shifts organizations need to make in a volatile, uncertain, complex, and ambiguous environment:

- from competition to collaboration,
- from static to evolving,
- from silos to systems,
- from narrow specialization to integration,
- from efficiency to creativity and learning.

If you look through the chapters of this book with those shifts in mind, you will recognize them everywhere. The case studies on AI in public administration, national strategies, and robotics in critical infrastructure all wrestle with how to move from protective silos to cooperative systems; from rigid role definitions to continuous reskilling; from purely national agendas to regionally and globally informed governance.

There is a concept in physics I often think about when I look at this community: spontaneous synchronization. If you place many small oscillators—a row of metronomes, for instance—on a shared base, they start out of sync. Over time, without any central command, they begin to align. Their rhythm con-

verges simply because they are connected through a common platform.

What GAFG, SILKROAD 4.0, and our partner organisations are trying to build is precisely such a platform for people: a base on which ministers, mayors, engineers, researchers, investors, and civil-society leaders can gradually "synchronise" around responsible, future-oriented uses of AI and robotics. Not in the sense of unanimous agreement—disagreement is healthy and necessary—but in the sense of shared direction, shared facts, and shared responsibility.

In that light, the events, courses, and summits you have seen referenced in these pages are not standalone spectacles. The Global Future Summit, for example, is the visible show of unity: the day when many separate streams of work briefly appear on the same stage. The deeper alignment happens before and after—when participants return to their ministries, companies, universities, and cities; when they test a policy suggestion, pilot a new collaboration, or quietly introduce a more responsible practice into their institution.

This e-book sits in the same category. It is a snapshot of a moving process. The ideas inside will evolve. Some proposals will prove too cautious, others too bold; new risks and opportunities will emerge that we cannot yet see. That is not a weakness but a sign that the subject is alive.

An afterword is also a place for gratitude.

My thanks go first to the participants of the programme—the first cohort of Certified Connectivity Specialists. You joined from forty-plus countries and from very different profession-

al realities. You brought honesty about the constraints you face and courage to question established patterns. You did not shy away from the uncomfortable parts of the AI and robotics debate: power, inequality, security, and the risk of losing the human thread in the excitement over new capabilities.

I am deeply grateful to our contributors and speakers, whose insights form the backbone of this volume, and to the editorial and coordination teams who turned recordings and notes into coherent chapters. And I want to acknowledge our institutional partners—within the D-8, in international organisations, in academia, and in the private sector—who have chosen to invest time, credibility, and resources into building this shared space.

* * * * *

Finally, a word to you as a reader.

If you have made it to this page, you are already part of the conversation. Perhaps you are a public official responsible for a new AI strategy. Perhaps you work in a company that is testing automation at scale. Perhaps you teach, or research, or advocate for communities who often sit at the receiving end of technological decisions. Wherever you are, your choices matter.

AI is not "just another technology." It is an accelerator. It can speed up innovation and cooperation—but it can also accelerate inequality, disinformation, and mistrust if governance and ethics lag behind. The future is not being written somewhere else by anonymous others. It is being shaped, piece by piece, in the decisions we take in our institutions and in our own behaviour.

The hope behind this book is not that you will agree with every chapter. It is that you will come away with better questions, a broader map of the terrain, and perhaps a renewed sense that you do not have to navigate it alone.

Unity to project strength.

Collaboration to create strength.

Dialogue to create trust.

* * * * *

If we can live those three lines in our work with AI and robotics—across borders, sectors, and generations—then the ecosystem that produced this e-book will have served its purpose.

The pages end here. The work does not.

Vienna, December 2025

Dr. Philipe Reinisch, GA FG's co-founder and Executive Officer

About the Editorial Lead, Editor and Contributors

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Dr. Philipe Reinisch

Dr. Philipe Reinisch is a technology strategist and global venture builder focused on designing future-ready innovation ecosystems at the intersection of emerging technology, governance, and global collaboration. He is the founder of **SILKROAD 4.0**, a network-of-networks and global venture acceleration platform connecting leaders from business, policy, academia, and investment to co-create scalable projects with real-world impact. He invented the **SILKROAD 4.0 Connectivity Framework**.

He also serves as Executive Officer and Co-Founder of the **Global Academy for Future Governance**, the publishing organization behind this volume, dedicated to strengthening leadership and institutional readiness in an era shaped by artificial intelligence, geopolitical complexity, and rapid technological change. Holding a doctorate in Industrial Engineering and drawing on extensive experience across innovation, strategy, and technology programs in both public and

private sectors, he supports senior decision-makers in translating complex technological shifts into practical, economically sound action grounded in trust-based partnerships and a people-centred approach.

For this volume, Dr. Reinisch served as Main Editor and Editorial Lead, curating and integrating contributions emerging from the Certified Connectivity Specialist program on AI & Robotics.

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Prof. Anis H. Bajrektarevic

Prof. Anis H. Bajrektarevic is a scholar of international relations and global political economy, and a long-standing contributor to debates on geopolitics, technology, and global governance. He is Co-Founder of the **Global Academy for Future Governance** and has served in academic, advisory, and institutional roles across Europe and internationally.

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(Additional contributors and speakers are credited throughout the volume in their respective sections.)

About the Publisher

Global Academy for Future Governance

The following section provides institutional context on the **Global Academy for Future Governance** (GAFG), the publishing organization behind this volume. It outlines GAFG's mission, scope, and operating principles, which inform—but do not substitute for—the diverse perspectives presented throughout this editorial compendium.

Mission

The mission of the **Global Academy for Future Governance** (GAFG) is to enhance long-term societal value creation across governments, businesses, academia, research communities, civil society, and consumers. GAFG approaches technology as one of the historically central drivers of development and seeks to support sustainable progress—aiming to maximize societal benefit over time while remaining attentive to hidden social, environmental, and systemic costs.

GAFG's work is guided by an interdisciplinary, cross-sectoral, and intercontinental perspective, integrating technological, political, economic, and cultural dimensions of governance, based on the **SILKROAD 4.0 connectivity framework**.

Scope

GAFG operates across multiple domains of governance and policy, with a focus on cross-dimensional and multidisciplinary engagement in its thinking, acting, and outreach.

Its activities engage with challenges spanning the five UN-declared spaces—land, sea, airspace, (near) outer space, and cyberspace—while maintaining a global outlook that respects regional and local specificities. Particular attention is given to the needs of the Global South, emphasizing governance approaches that link economic development with human development in ways that are just, realistic, and attainable.

GAFG Modus Operandi

GAFG supports governmental decision-makers—and those who prepare and inform decisions—by helping to distinguish, within fast-moving technological environments, what is strategically relevant from what is overstated, speculative, or driven primarily by media narratives and short-term market incentives.

Its work focuses on identifying issues that require timely attention by public institutions and responsible corporate actors, with the aim of reducing social, financial, labor-related, political, environmental, and ethical costs, while directing attention and action toward matters of lasting significance.

GAFG operates as a neutral and discreet partner, prioritizing trust, confidentiality, and contextual sensitivity. This approach is particularly relevant for institutions in regions where capacity constraints may limit rapid, impartial, and high-quality responses to complex governance challenges.

GAFG

The views and contributions presented throughout this volume reflect the perspectives of individual contributors and do not necessarily represent institutional positions of the publisher.

With immense gratitude, we honour our speakers, whose wisdom, generosity, and unwavering endurance carried this vision into being.

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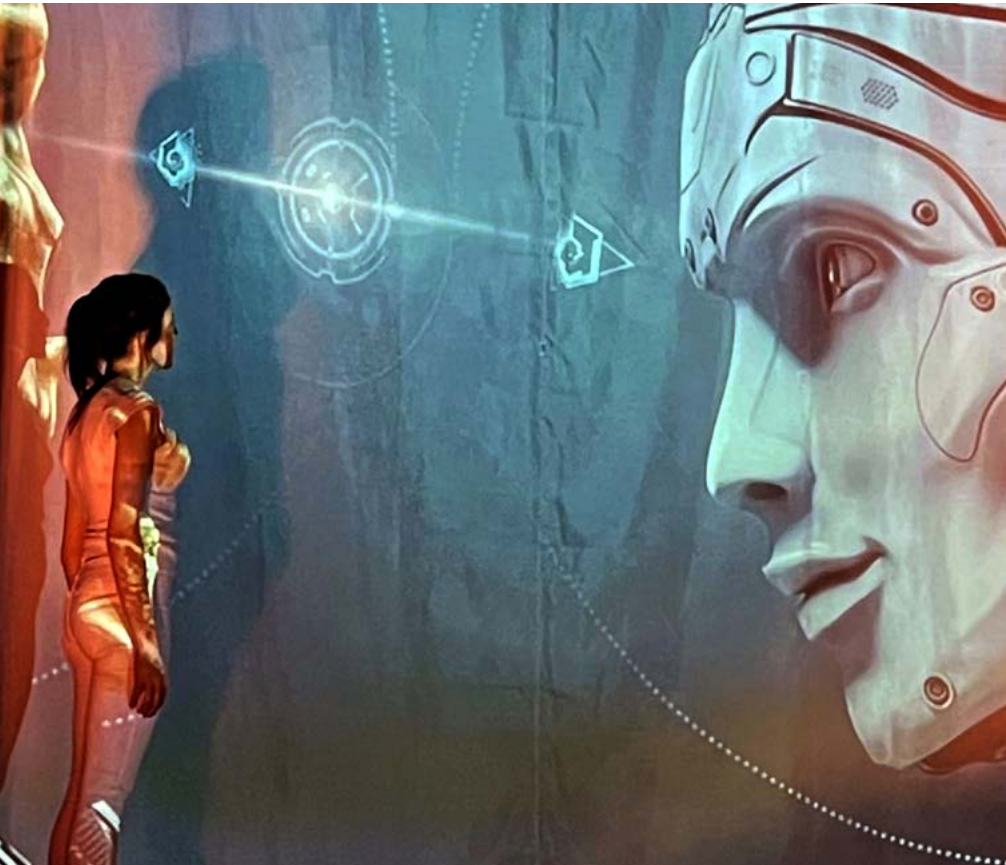

Understanding
AI & Robotics

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UNDERSTANDING AI & ROBOTICS

Dr. Philipe Reinisch
Kamilla bogdanova, Jenna Ellis, Shu Wang

AI is not "just another technology." It is an accelerator. It can speed up innovation and cooperation—but it can also accelerate inequality, disinformation, and mistrust if governance and ethics lag behind. The future is not being written somewhere else by anonymous others. It is being shaped, piece by piece, in the decisions we take in our institutions and in our own behaviour.

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